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PREPAREDNESS—LOOKING BACKWARD.

Extract from a letter written by ———— to a friend in ————, August 1, 1920.

DEAR M————:

Since my last, things have moved rapidly if not pleasantly for our country and for the rubber trade. The war, our first with a really first class power, has now been on for six months—a half year of disaster. Such preparedness as we had indulged, rendered ineffective by graft, incompetence and politics, availed us hardly at all. Our navy defeated, our soldiers on the defensive, we are in sore straits—yet the whole country is rallying for real defense in a manner that promises a final triumph no matter how long delayed.

Aside from the scarcity and consequent high price of crude rubber, the trade is doing well. The factories on the Atlantic Coast have established headquarters either in Cleveland or Chicago. Manufacturers in the Middle West have taken over the work of some Eastern mills, while others have simply closed their doors.

The arrival of a merchant submarine at New Orleans with a thousand tons of rubber cheered the manufacturers exceedingly. They gladly paid the price, $5. a pound, and made the intrepid captain a substantial present besides. It is believed, by the way, that the present price is high water mark and that within a few months three-dollar rubber is a possibility. This belief is founded upon the supplies of guayule that are beginning to arrive. Several plants have also been erected in Colorado and are able to extract rubber profitably from the *Picradenia*, which is very abundant. Central rubbers have begun to come in, as Mexico, and the countries south of her, rising to the bait of high prices, are tapping everything that contains latex, and the aggregate is considerable. With the completion of the motor truck railway from Guatemala to Panama, and the linking up with the road from Colombia to Bolivia, South American rubber will come overland, provided, of course, we continue as in the past, to hold the Panama Canal.

It is splendid to note the cheerfulness with which all respond to the general call for economy in the use of rubber goods. The motor cars of the millionaires run on tires that long since failed to hold air and are filled with "tire fillers" and often covered with leather to hold core and carcass together. Rubber clothing has disappeared and slickers of a new, odorless type have taken its place. City buildings stripped of their rubber tiling and matting have added much to the vast quantity of scrap needed when the crude rubber supply was first shut off. Trench boots are the only goods turned out by the great footwear factories. Indeed, all of the rubber in the country is practically at the service of the government. It is most interesting to note the anger expressed toward our former agricultural department because they allowed us to be so long dependent upon foreign sources for our crude rubber. Experiments begun in the last few months show conclusively that there are several rubber producers that could be grown within our own borders. Not the kind that produce latex, but those of the guayule and grass rubber sort, that contain rubber itself.

It is said, also, that certain scientists are experimenting with the *Ekanda* root to see if by a process of selection a variety cannot be obtained that contains a larger amount of rubber milk. Could this percentage be increased enough, it might result in a great industry not unlike that of the sugar beet—but with rubber, not sugar, the extracted product.

The only important compounding ingredient that the war has cut off is whiting, but there are so many earthy

fillers available that no especial hardship has been felt by its absence.

Of course, our export trade has been entirely destroyed. The few airships that venture forth cannot afford to carry freight, the mails alone taking all available room.

In the meantime the non-resistants are holding meetings and advocating the offer of a huge indemnity to the enemy to call the fight off. As if it were not disgrace enough for us to have been forced to pay the huge sums for the safety of New York, Philadelphia, and Washington, followed by the destruction of the latter city because a civilian wounded a soldier. No, the rubber trade are not for peace at present, but after this war is over, they and hosts of others are going to be strong for PREPAREDNESS. It is a bitter, costly lesson, but we had it coming, and believe me, it is one that will be thoroughly learned and long remembered. Sincerely,

X———.

RUBBER PRICES WHEN PEACE IS RESTORED.

THE question of rubber prices, after the European war, is of interest, not only in producing, but more emphatically in consuming countries. Our British contemporary, the "India Rubber Journal," is of the opinion that there is a definite danger of violent price fluctuations once peace is declared. The war period has brought new influences to contend with, but there will be still another factor to be reckoned with, when peace is really in sight. Then speculators are likely to come forward under the unusual and almost certain demand. Austria and Germany will want 40,000 tons of raw rubber, or its equivalent in manufactured rubber goods, within a year of peace being declared, while the allied countries will be large buyers at the same time.

The Journal believes that therefore the demand on account of the enemy and other countries is likely to be formidable, and so insistent that prices may run wild; the rise in price may be checked by London and New York agents holding their hands for a little time until stocks have accumulated. If either side becomes too powerful we shall see prices which will be unreasonable, and which may affect not only spot sales, but forwards, for many years to come.

Further, our contemporary states that;

While commercial groups convene to discuss trade developments after the war it has heard of no steps being taken to check any irrational development during the peace phase referred to. Growers alone would never do anything which would in any way affect the law of supply and demand, and any action, to be successful, would have to secure coöperation of buyers' and sellers' agents, an almost impossible arrangement. This will be the most vulnerable period and the possibilities are so great as to demand timely consideration. No one wishes Germany and Austria to get their rubber cheap, especially since the major part of the plantation supplies comes from British possessions. But, on the other hand, no one wishes home trade to be penalized by the activities of agents who will be out for produce so long denied by our navy.

While there is much theorizing regarding prices at that time, and later, it seems well worth considering that the Eastern plantations will raise this year, or next, that 40,000 tons extra needed by Germany and Austria, thus in no way interfering with the normal demands of the rest of the world, while, if this amount is not sufficient for the period under consideration, England can throw into the market some of the raw rubber she is now storing for the very purpose of preventing it from getting in the possession of nations fighting against her. It looks as if the whole question of preventing unwise speculation is quite largely in the hands of the British themselves, either in London or in the Far East.

THE EMPLOYERS' PATRIOTIC DUTY.

WHEN the orders came for the militia to proceed to the frontier, many thousand men answered the call of duty, leaving their stores, offices or workshops to serve their country. What is more, they left their homes and families, and probably, in many cases, they left their families but meagerly provided for, or totally without means of support during their absence.

These patriots are doing their duty to the country at a tremendous sacrifice. Are those who stay at home doing their duty? Are they also sacrificing? Many employers, in fact a large proportion of them, are carrying the absent soldiers on their payrolls. Thus they are enabling the soldiers to continue to support their families. Such a course cannot be universal, but the more general it becomes, the nearer will employers come to bearing their just burden, and doing their full share of sacrifice for the nation.

THE MOST SIGNIFICANT FEATURE OF THE RUBBER CLUB outing this year was not the attendance, the sports, nor the dinner. They were all of the biggest, the most enthusiastic, and the best. It was the special train that bore the guests from distant centers, and returned them speedily and comfortably when the day was done. It showed that the club was no longer local even as far as New York is concerned.

IT HAS LONG BEEN PREDICTED THAT MOTOR TRUCKS would in time outnumber pleasure cars. The new detachable flanges that adapt motor truck wheels to railroad tracks will be a potent factor in increasing the use of trucks. Possibly the flanged wheels for the rails will be rubber shod, in time giving rail speed equal or greater than road speed. At all events every truck, whether fitted for railroad use or not, is equipped with the regulation rubber tires and ever will be.

The Electric Storage Battery in the Motor Car.

IT is estimated that there are 28,000 electric vehicles in the United States, of which 20,000 are pleasure and 8,000 are commercial cars. The cost of the average battery to the manufacturer, for a pleasure car, is about $300, and $500 for a commercial car; so that $4,000,000 is the sum expended for automobile batteries and $6,000,000 for commercial car batteries. The average number of hard rubber jars in a pleasure car is

Fig. 1. Willard Vehicle Battery.

32, and 44 for the commercial, or a total of 1,000,000 jars. The average cost is $1.50 per jar to the manufacturer; which figures a total of $1,500,000 for hard rubber jars.

There are about 1,500,000 starting and lighting batteries being used in the United States, costing the manufacturer an average of $15 each or a total of $22,500,000. There are three cells to the average battery, or 4,500,000 jars in use, which cost the manufacturer about $1.00 each or a total of $4,500,000 for hard rubber jars.

The above estimates do not include hard rubber covers, separators and vent plugs, which would materially increase the grand total of figures for hard rubber used in electric storage batteries.

This article will cover the storage battery only as applied to automobiles and commercial cars for driving, starting, lighting and ignition purposes. Such batteries are also used for house and railway car lighting, for lighting, power and ignition in motor boats. In radio apparatus they are indispensable, and recently the submarine has emphasized the importance of the storage battery and its hard rubber insulation in modern warfare.

The fundamental principle of the electric storage battery is best illustrated by the voltameter, a well-known instrument in which water is decomposed by an electric current. The voltameter consists of a glass jar containing two platinum plates covered with acidulated water and connected by wires to an electric battery. When an electric current is established, small bubbles of oxygen collect on the positive plate, or electrode, and of hydrogen on the negative electrode. If the battery current is cut off and the two electrodes connected to a galvanometer, a reverse current is registered. For storage battery purposes, however, the electrolysis of water was unpractical, as the hydrogen and oxygen quickly escape.

Planté invented a cell in which two lead plates insulated by hard rubber strips were placed against each other and covered with sulphuric acid diluted with water. When electric current is passed through the electrodes the water or electrolyte is decomposed, the oxygen separating at the positive plate and the hydrogen at the negative. The positive plate becomes oxidized and covered with a coating of lead peroxide. When the battery current is cut off and the plates connected, a reverse current is established and the peroxide is reduced to lead, while the other plate becomes oxidized.

Fauré's improvements consisted in coating both plates with red oxide of lead paste, which contains a smaller proportion of oxygen; thus the current only has to form peroxide on one plate and reduce the oxide on the other.

Many improvements have been made by modern inventors toward correcting the inherent defects of the original types. The most successful modern storage batteries depend on the same chemical reaction as in the original Planté cell, but with one notable exception—the Edison—which uses nickel-steel plates in an alkaline solution, with the advantage that the battery is much lighter, and also that the absence of the sulphuric electrolyte makes possible the use of a metallic jar.

Hard rubber has been found to be practically the only flexible insulator impervious to the action of sulphuric acid, which is the basic electrolyte in the lead storage battery. For that reason, hard rubber jars, separators, vent-plugs, hold-downs, and insulation tubes are used; also soft rubber gaskets, plugs and rubber-insulated battery terminals. Descriptions of a few of the well-known types of vehicle storage batteries will in a general way cover the entire field.

THE WILLARD BATTERY CELL.

One of the best-known is the "Elba." A 6-volt cell type "M-11" is shown in Fig. 2. The individual cell principle is employed in all types; any one cell can be inspected or repaired without disturbing the others. The plates are the pasted type and the grid is made of an alloy consisting of lead and antimony. The jar, cover, hold-downs, vent and perforated separator are of hard rubber; the vent-plug and sealing gasket are of soft rubber. The separator might be compared to a piece of lace. It is honeycombed with holes and, therefore, allows the electrolyte to seep through evenly so that the battery gives maximum service at all times. The separator is ridged with rubber strips which protect it against wear by the abrasion caused by the vibration of the car.

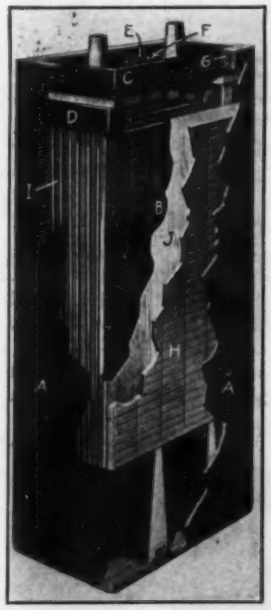


Fig. 2. Elba Cell—Type "M-11."

A—Hard Rubber Jar. *B*—Hard Rubber Perforated Separator. *C*—Hard Rubber Cover. *D*—Hard Rubber Hold-downs. *E*—Hard Rubber Vent-Plug. *G*—Soft Rubber Gasket. *H*—Positive Plate. *I*—Negative Plate. *J*—Wood Separator.

The plates measure 5¼ by 8⅝; there are 11 to each cell and the discharge is 27½ amperes for 5 hours. The complete cell measures 3⅝ by 6⅛, by 13⅞ inches high and weighs 30½ pounds.

THE E. S. B. CELL.

The "Ironclad-Exide" cell, type "7-MV," is shown in Fig. 3. The positive plate is of novel construction. It has a grid composed of a number of parallel, vertical metal rods united integrally with the horizontal top and bottom frames. Each rod forms a core which is surrounded by a cylindrical pencil of peroxide of lead, the active material. This, in turn, is enclosed by a hard rubber tube having a large number of horizontal slits. These serve to provide access for the electrolyte or solution to the active material, and yet are so fine as to practically eliminate the washing out of the material. The outside tubes are reinforced by leaving the exposed edge solid, that is, without slits.

Each tube has two parallel, vertical ribs projecting on oppo-

site sides at right angles to the face of the plate and these not only serve to stiffen the tubes, but also act as insulating spacers. The rubber tubes have a certain amount of elasticity, allowing them to compensate for changes in volume of the active material, due to expansion and contraction during charge and discharge. The negative plate consists of gray spongy lead and the top and bottom edges are encased in rubber vulcanized in place. This eliminates the possibility of short circuits from

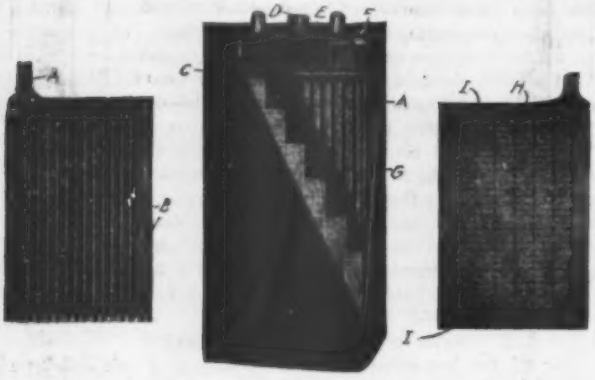


FIG. 3, "IRONCLAD-EXIDE" CELL—TYPE "7-MV."

A—Positive Plate. *B*—Hard Rubber Tubes. *C*—Hard Rubber Jar. *D*—Hard Rubber Vent. *E*—Soft Rubber Plug. *F*—Hard Rubber Cover. *G*—Wood Separator. *H*—Positive Plate. *I*—Hard Rubber Insulator.

material bridging across from the positive frames. The negative frames are undercut so that the rubber sheathing is flush and does not project beyond the surface of the plate. There are 7 plates, which measure 5¾ by 8⅝ inches, and the discharge in amperes for 4½ hours is 21. The rubber jars are 2¾ by 6⅛ by 12⅜ inches high and weigh 22¾ pounds.

THE U. S. H. & L. BATTERY CELL.

The positive plate of the U. S. L. type "WB," shown in Fig. 5, is made up of antimonious lead grids of the staggard bar type. A paste mixture of oxides forming the active material is forced into the cells of the grid under pressure, giving the finished plate a dark brown color.

The grid of the negative plate is made up of an antimonious center web with thickened edges to give it strength and rigidity.

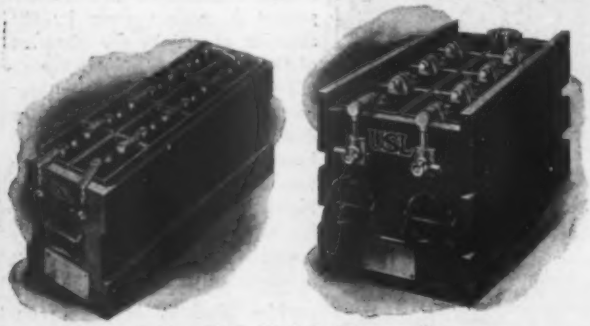


FIG. 4, THE U. S. H. & L. VEHICLE BATTERY.

The active material is applied under pressure, resulting in a finished plate of a slate gray color.

The bridges in the hard rubber jar have soft rubber tops on which the plates rest. These act as shock-absorbing cushions. The size of the plates is 5¾ by 8⅝ inches, and the 7-plate cell will discharge 21 amperes in 4 hours. The jars measure 2¾ by 6⅛ by 13⅜ inches high, and the cell complete weighs 22½ pounds.

THE EDISON BATTERY CELL.

The Edison type "A-4" cell consists of four positive, and four negative plates. (See Fig. 6.) The former are made of per-

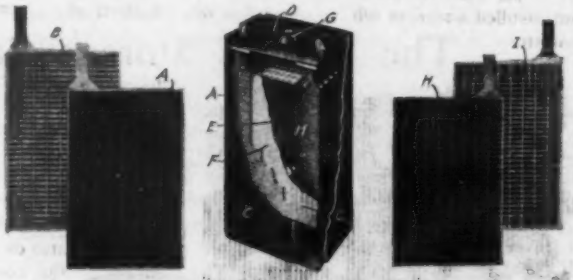


FIG. 5, U. S. H. & L. CELL—TYPE "WB-7."

A—Positive Plate. *B*—Positive Grid. *C*—Hard Rubber Jar. *D*—Hard Rubber Cover. *E*—Hard Rubber Separators. *F*—Wood Separators. *G*—Hard or Soft Rubber Vents or Extensions. *H*—Negative Plate. *I*—Negative Grid.

forated nickel-plated steel tubes, filled with alternate layers of nickel hydrate and metallic nickel flake. The negative plate contains pockets of perforated steel, holding iron oxide, the negative active material. The four positives are supported on a horizontal rod, forming part of the pole or terminal. They are spaced apart by nickeled steel washers, and clamped firmly by a nut on each end of the rod. The five negatives are similarly mounted on their pole. The two groups are then assembled. In order to support rigidly the edges of the plates, there are placed thereon two hard-rubber "ladders," each of which has grooves into which the plates fit. The compact mass is then ready for the can.

The hard-rubber "stool," or plate support, is then placed in the can bottom, and the grouped elements pushed in. Two

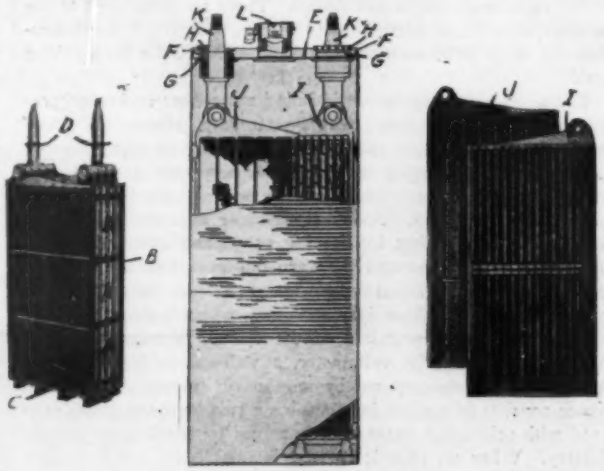


FIG. 6, EDISON CELL—TYPE "A-4."

A—Hard Rubber Separators. *B*—Hard Rubber "Ladders" *C*—Hard Rubber Support. *D*—Hard Rubber Washer. *E*—Hard Rubber Cover Insulation. *F*—Hard Rubber Bushing. *G*—Soft Rubber Gasket. *H*—Hard Rubber Gland. *I*—Positive Plate. *J*—Negative Plate. *K*—Poles. *L*—Filling Aperture. *I*—Positive Plate. *J*—Negative Plate.

thin sheets of hard rubber are next placed between the outside negatives and the can ends, and after a hard-rubber washer is slipped over each pole, the top is placed in position and welded on.

A hard rubber bushing is next placed over the poles to insulate them from the can top. Into the little well around each pole is placed a pure gum gasket, followed by a metal ring. The hard-rubber threaded glands are forced home, resulting in the compression and expansion of the gasket, with consequent sealing around the poles. Mounted on the top between the two terminals is the gas vent and filling aperture combined.

The electrolyte is then put into the cell. This is composed

of 21 per cent solution of chemically pure potassium hydrate and distilled water, to which is added a small amount of lithium hydrate.

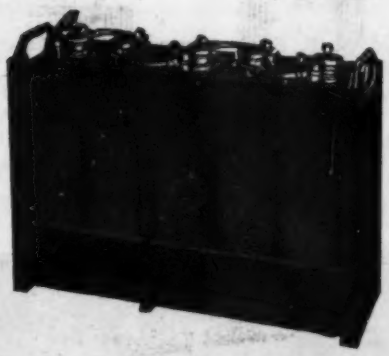


FIG. 7. THE EDISON VEHICLE BATTERY.

The cells are assembled in batteries, charged and discharged three times, and finally inspected, when they are ready for use. The "A" type cell with 4 positive plates discharges at the rate of 30 amperes for 5 hours. The dimensions of the cells are 2 11/16 by 5⅛ by 13 7/16 inches high and weigh, complete, 135 pounds.

STARTING, LIGHTING AND IGNITION BATTERIES.

The batteries used in connection with electric starting systems are selected for their ability to crank the engine at sufficient speed, and for a sufficient length of time, to insure positive starting, especially when the engine and mechanism is stiff, due to cold weather or maladjustment.

The rates of discharge are high, yet the starting battery must occupy little space and be of minimum weight. It must withstand shocks, jolts, short circuits, charges at 16 times above normal rates, and discharges at 25 times above the normal or ideal rate.

FIG. 8. THE WILLARD STARTING BATTERY.

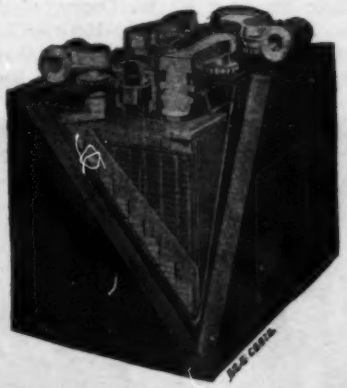


FIG. 9. THE "EXIDE" STARTING BATTERY.

For lighting purposes a high capacity battery is necessary, owing to the greater amount of current needed. Ampere discharge rate plus capacity in hours is the only true indication of battery value. The lower the discharge rate in amperes the greater the capacity in hours obtained. Lighting batteries may also be used for ignition and operating electric horns.

A tire filler that has been recently exploited in Chicago by mysteriously withholding the name and sponsors of the compound is now announced as "Tireoid." It is manufactured by the Tireoid Co., 1200 Michigan avenue, Chicago, Illinois. W. L. Rohrer, of Chicago, is president, and among other prominent men connected with the company are A. Watson Armour, Martin J. Insull, Lafayette Markle and James Levy. The compound was invented and patented by R. T. Garvin.

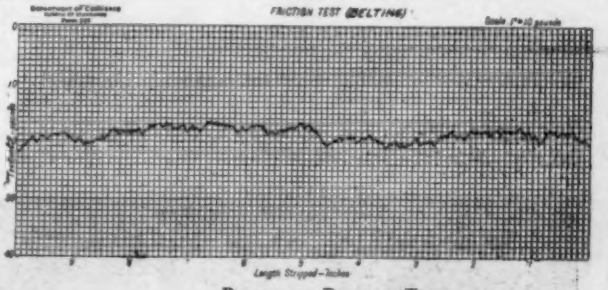
The National Rubber Co., Elgin, Illinois, has recently increased its capital stock from $10,000 to $60,000.

AUTOGRAPHIC FRICTION TEST OF HOSE AND BELTING.

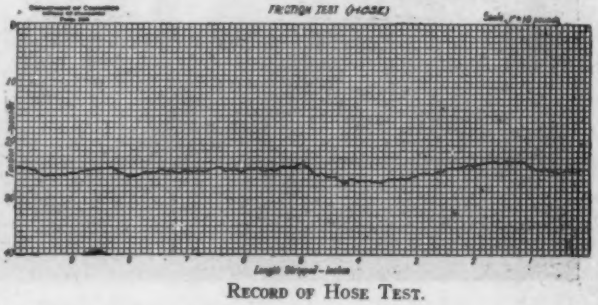
THE methods and resultant autographic charts of hose and belting friction tests made on the autographic testing machine that was illustrated and described in THE INDIA RUBBER WORLD, May 1, 1916, are shown in the accompanying illustrations through courtesy of the Bureau of Standards, Washington, D. C.

The views show only the upper details of the machine as it appears when making the tests. The one on the left is seen with the hose sample in place and the autographic pen recording the friction or adhesion between the plies at all points of the strip being tested. The sample consists of a round section of hose one inch wide, and is fitted over a mandrel that revolves in a fork suspended from the top of the machine, the detached end of the fabric being secured to the lower grip.

On the right the machine is shown while making a rubber belting test and recording the variations of the friction curves at the same time. The test piece consists of a one-inch strip containing two plies that are separated for a short distance to afford space for attaching the grips. One end is attached to the upper and the other to the lower grip, and as the plies are pulled apart by the machine the autographic attachment records the adhesiveness at all points of the sample strip.



RECORD OF BELTING TEST.



RECORD OF HOSE TEST.

The charts shown above are exact reproductions of the records made of the above tests at the Bureau of Standards. The figures on the left margin of the charts represent the tension in pounds.

The variation at any point on the strip being tested is readily seen by referring to figures at the bottom of the charts. These figures represent the length of the strip tested, in inches.

Rubber Club of America Outing.

MEMBERS of the Rubber Club of America, Inc., were in a state of preparedness for at least 60 days prior to July 18—preparedness for the outing of the club scheduled for that date. Reports were rife that every wielder of a golf club was working every Saturday as well as every spare evening as long as it was light enough to see a golf ball, and it is intimated that some of them painted these balls with phosphorescent material in order to prolong their practice. It was the same way with tennis players, swimmers and quoit pitchers. All were practicing in order to capture some of the handsome prizes the club was sure to offer in the contests.

The time, as stated above, was July 18, all day and part of the night. The place, Vesper Country Club, Tyng's Island, on the Merrimac River, near Lowell, Massachusetts. It is doubtful if a more suitable place could be found in any one of a dozen states. Those who attended the outing there last year knew this, and those who came this year for the first time agree unanimously with the others.

OFFICERS AND PAST PRESIDENTS PRESENT:

Standing;—Secretary Vorhis, Past President Fearson, Director Bruyn Past President Hood. Sitting;—Vice-President Cartmell, Past President Hodgman, President Firestone, Director Litchfield.

And there were many new-comers this time. For instance, two special Pullman cars started from Akron, Ohio, on Sunday night with nearly 40 rubber men, in charge of H. S. Firestone, president of the Rubber Club; W. O. Rutherford, general sales manager of the B. F. Goodrich Co., and Secretary C. B. Raymond of the same company.

The Firestone Tire & Rubber Co. was also represented by R. J. Firestone, S. G. Carkhuff, J. W. Thomas, R. E. Glass, H. W. Kugler, C. A. Myers, H. J. Adams, E. C. Knox, H. W. Smith, and last, but by no means least, E. S. Babcox, the advertising manager.

Besides Messrs. Rutherford and Raymond, the Goodrich company's force was represented by E. C. Tibbetts, the advertising manager, W. H. Yule, W. C. Geer, H. E. Kelly and H. M. Bacon.

AT NOON TIME MEMBERS WERE BUSY DISCUSSING THE EXCELLENT LUNCH PROVIDED.

The Goodyear Tire & Rubber Co. had as its quota, Vice-president P. W. Litchfield, W. D. Shilts, M. E. Morris, E. S. Stevens and R. H. Daniels.

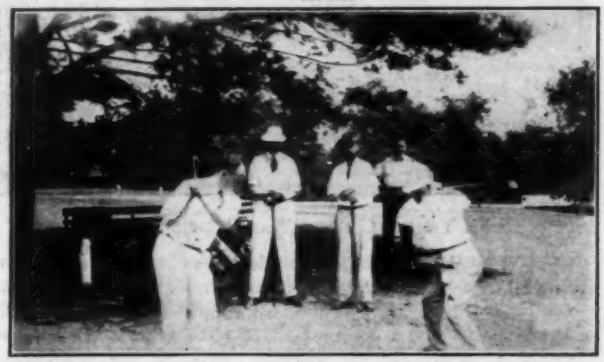
Others of the party included President Thomas F. Walsh, of the Swinehart Rubber Co.; President H. W. Dupuy, of the Pennsylvania Rubber Co.; E. C. McGraw, of the McGraw Tire & Rubber Co.; Treasurer C. W. McLaughlin, of the Mohawk Rubber Co.; Vice-president J. H. Kelly, of the Republic Rubber Co.; Frank Lahey, Harold French, William McArthur, Jack Handy, Sydney D. Gridley, Leroy Wood, W. H. Bass, A. R. White and Harry Henderson. This big delegation arrived in Boston, Monday noon, where they were met by representatives

MEMBERS AND GUESTS OF THE RUBBER CLUB OF AMERICA, INC., AT THE

of the Eastern manufacturers, and after a lunch at the Copley Plaza, were taken in automobiles to various points of interest on the North Shore, and to dinner at the Masconomo House at Manchester, Massachusetts, returning late in the evening.

Monday night a train of five sleepers and a buffet car left New York City with about 80 rubber men from that city and nearby manufacturing centers, which ran direct to Lowell and debarked the passengers at the land end of the famous vibrating suspension bridge leading to the grounds.

The Boston contingent, between 100 and 200 strong, and the Lynn Cadet Band came in another special train to the same spot. Besides these who arrived by rail, there were automobiles a-plenty. Massachusetts cars, of course, were in the majority,

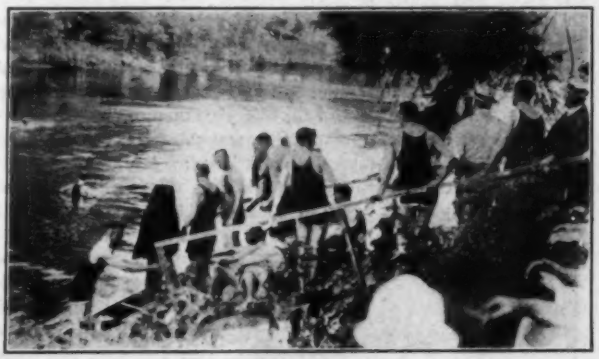


TEAM WORK DRIVE. YOUNG, A LONG DRIVE, AND JONES, A STRAIGHT DRIVE, IN COMBINATION DRIVE. RESULT, A LONG STRAIGHT BALL.

but there were Mr. Darrach's and another car from Connecticut, Mr. Milligan's from New Hampshire, Mr. Murray's from New Jersey, Mr. Firestone's from Ohio, and Mr. Berkenstein's from Illinois.

The new-comers, or perhaps we should say, those who attended for the first time, certainly had no cause for complaint at their cordial reception. Old acquaintances or new, it was a hearty welcome of good fellowship. No one stood on ceremony. There was the usual sorting out into bunches of congenial members, and those who did not care to enter into the strenuousness of the sports, found enjoyment in quieter ways on the clubhouse veranda.

The elaborate series of tennis courts were occupied practically all day. The golf course, a splendid one, was never free from players. There were so many entering some of the contests that it took the main part of the day to choose the winners by the process of elimination. As a guess, there were probably 50 entrants in the quoit contest, which finally narrowed down to two, F. Feinburg securing the first prize, a fine chafing dish, and A. R White capturing the second prize, an electric lamp.



THE WATER SPORTS INTERESTED MANY PARTICIPANTS, AND A HOST OF SPECTATORS.

The clock golf contest was to start at noon, but as lunch was announced at the same hour, the game was postponed until after this feature of the program. Seated around tables under the shadow of great trees, the members were served edibles and drinkables to their heart's—or their stomach's—content. Meanwhile the band played—in fact the band played pretty continuously all day and evening, sometimes with a volunteer leader to whom, in his good nature, Leader Lurvey temporarily surrendered his baton.

The clock golf interested 37 contestants and as many spectators as could be accommodated around the rim of the field. H. S. Firestone started off. His score was 21. There were four whose score was 23 and who were therefore pronounced the "Skidoo Club." The contest finally narrowed down to P. E. Young and R. L. Chipman, who tied at 18. Chipman said Young was taking too many prizes, so he beat him 21 to 22, and won a pair of beautiful silver mounted hair brushes.

In the golf tournament, W. S. Carleton held the best gross score, 83. E. C. Clark and F. H. Jones were tied for best net, Clark's score being 84, handicap 8, net 76, and Jones scoring 91, handicap 15, net 76.

Harry Tyer had charge of the ball game. In order to get it

SEVENTEENTH ANNUAL OUTING AT LOWELL, MASSACHUSETTS, JULY 18, 1916.

started, and to secure a fairly large "bleacher" crowd, he induced the band to march at the head of the players to a spot on the main land, either in New Hampshire or Massachusetts, this point being disputed by those who walked in the hot sun and those who rode comfortably in automobiles. Arrived at the ball field, they found it newly mowed, while a twentieth century Maud Muller and her father cleared the diamond for the game. As the thermometer registered 90 degrees in the sun, and there was no shade, the game was certainly a hotly contested one, the Giants against the Red Sox, and both against the umpire. F. H. Appleton, Sr., was the umpire, and his decisions were the cause of much good-natured raillery. The heat, the strenuousness of the work, the anxiety of each captain to win, resulted in so many changes that the score sheet looked like a plan of battle in Europe. The score was 5 to 1 in favor of the Giants.

CLARENCE H. LOW, WHO DONATED THE MAGNIFICENT CUP FOR THE INTER-FIRM DOUBLES COMPETITION.

From the sizzling hot baseball field to the water sports was a grateful change. Bathing suits were provided, and some who didn't enter the tilting or swimming matches, took a plunge in the cooling river. The swimmers shot through the water as if New Jersey sharks were pursuing them, but C. E. Murray led all the rest at the end of the 100-yard race, and was awarded a silver pocket-knife of the most approved Maine State prohibition pattern.

There was rare fun in the canoe-tilting contest, which was won by A. R. White, who flourished the pole, and H. N. Grieb, who presided at the paddle. The prize was a "library" set.

There were many pillow fight duels in the cock fight contest. W. L. Pitcher downed every antagonist, and won a pair of gold sleeve-links. A handsome cut glass silver-mounted bottle went to P. E. Young for the longest drive in the driving contest.

Eighteen couples entered the three-legged race, and some very curious and furious hustling resulted. Haldane and White were the final winners, and each carried home a fine thermos bottle as a prize.

Clarence H. Low, of the United States Rubber Reclaiming Co., Inc., generously donated a beautiful silver and copper cup to be contested for in the Inter-Firm Doubles Competition, this trophy to become the permanent possession of the firm member of the club whose team wins it three times. Teams will consist of two representatives of each firm member, but need not necessarily be the same players each year. Teams from seven firms participated in the initial contest. They represented Gove & French, Inc., J. T. Johnstone & Co., United States Rubber Reclaiming Co., Firestone Tire & Rubber Co., Hood Rubber Co., United States Rubber Co. and Plymouth Rubber Co. The contest narrowed down to the Gove & French and the J. T. Johnstone teams, the latter winning by a score of 6-3, 6-3 and 6-2. This firm will hold the cup until next summer's outing, when it is believed that even a larger number of teams will enter the contest. The singles tennis matches had 21 entrants. Many of these were also in the doubles, and the day was not long enough nor the players' strength sufficient to decide the contest. The winners of the semi-finals were John L. Handy and Clarence H. Low. The final playoff was at the New York Athletic Club, Travers Island, Mr. Handy showing the true sporting spirit in coming from Akron on July 26 for the purpose. Mr. Low won, the score being 6-2, 6-2, 4-6 and 6-2. Mr. Handy did not go back empty-handed, but carried a handsome silver cup as second prize.

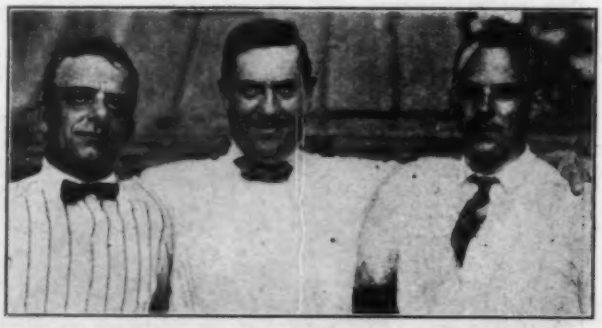
The call for dinner was answered with alacrity. All appe-

THE CANOE TILTING CONTEST WAS EXCITING AND AMUSING.

tites were sharpened; if not sufficiently so, at each plate was found either a hatchet or a dagger, murderous in appearance, but found to be of rubber, and harmless. Each man was furnished a handsome fez and a necktie, both of red rubber, which he was directed to wear, and the assembly presented the appearance of a lodge of Shriners.

The menu was ornamented with a drawing of a rubber plant, with several human heads "rubbering." The substantials were:

Cocktails
Steamed Duxbury Clams
Clam Bouillon
Olives Radishes
Broiled Live Lobster, Julienne Potatoes.
Champagne
Cigars Cigarettes
One-Half Stuffed Native Chicken, Delmonico Potatoes
New Peas Green Corn
Canteloupe and Ice Cream
Roquefort Cheese Toasted Crackers Cafe Noir



THE OUTING COMMITTEE: F. H. APPLETON, JR., ROBERT L. RICE and PHILIP E. YOUNG.

As is the invariable rule, no speeches were delivered at or after the dinner. At its conclusion, the Boston contingent boarded the special train in waiting, and an hour later the New York train took its quota and some of the Westerners back to New York, and thus ended an occasion which will long be remembered by all who participated.

Much credit for the smooth running of the whole affair must be given the committee: Philip E. Young, Robert L. Rice and F. H. Appleton, Jr., as well as those having special charge of the contests: M. G. Hopkins, Clarence H. Low, W. L. Pitcher, Wallace G. Page, Henry G. Tyer, Raymond Drake, Lloyd E. Appleton and Thomas F. Kimball, all of whom added to the enjoyment of the occasion.

Rubber Cements in Leather Goods Manufacture.

ONE of the most valuable uses of rubber, and also a most wide-spread one, is as an adhesive. As such, it is a necessity in many trades. Rubber cements are many and varied, differing in properties and qualities according to the requirements of the various uses.

In manufactures of leather, good rubber cements are especially valuable. While many leather articles are made by stitching the different parts together, others, particularly those of lighter leather, are fastened wholly by cementing, or by cementing and then reinforcing by stitching. Rubber cements figure in many trades. Bag and pocket-book makers, hatters, box makers and shoe manufacturers use large quantities. These cements are used today for purposes which years ago were undreamed of. Some of them have a tenacity sufficient to be used in processes where formerly tacks were employed. This is the case with sole-laying cement, used in shoemaking, to hold the sole in place to the lasted upper, preliminary to stitching.

And in many other processes of shoe manufacture cements are used, their composition varying to adapt them to the special work they are required to perform.

In trade parlance, cements made of gutta percha are included under the generic name of rubber cements, though the purist might pronounce such a misnomer. As a rule, cements are mainly solutions of gums in naphtha. There are other solvents: chloroform, ether, bisulphide of carbon are efficient for this purpose, but are too expensive for general use. For some degrees of tenacity gum mastic, gumlac, or ordinary rosin is added. Such cements require heating and softening to apply, but these ingredients add brittleness, a quality which unfits cements containing them for joining where suppleness is required.

SOLE-LAYING CEMENT.

To make a cement for sole laying, the following formula is recommended: Lagos buttons or strips, 10 pounds; Pontianak, 5 pounds; naphtha, 20 gallons. This is also used as an oil proof.

CHANNEL CEMENTS.

Channel cements are used to close the lip of leather which has been raised to allow the sole to be stitched to the welt, the object being to cover the stitches and give a smooth, unbroken finish. For such cement various formulas are presented. For these, the rubber used is washed but not sheeted. Three of these are similar, but the quantity of rubber varies. Each contains 5 pounds of rosin and 40 gallons of naphtha, but one calls for 10 pounds, the second for 20 pounds and the third for 30 pounds of Para rubber.

A fourth channel cement calls for 10 pounds of Madagascar pinky, 40 ounces of rosin and 20 gallons of naphtha.

Number 5 requires 12 pounds of Madagascar rubber, 12 pounds of Madagascar niggers, 8 pounds of rosin, 2 pounds of common pitch and 50 gallons of naphtha.

Another channel cement receipt is 6 pounds of fine Para rubber, 4 pounds of hard African rubber, 16 gallons of naphtha, and of rosin, 3 pounds in the summer or 2 pounds in winter.

COLORED CEMENTS.

If colored cements are desired, most formulas are practically the same as the first three channel cements mentioned above, with aniline dyes in proper proportions. For instance, a batch of 40 gallons, to be colored black would require ½ ounce of black aniline. For red cement, ½ ounce of red aniline is needed to each 40 gallons. Blue cement would require 2 ounces of blue aniline. Green cement should have 2 ounces of green aniline. Yellow cement needs 3 ounces of yellow aniline to acquire the proper color. Another black cement is made of Para rubber, 20 pounds; rosin, 5 pounds; bone black, 5 ounces; and naphtha, 40 gallons.

WELTING CEMENT.

For welting cement 10 pounds fine Para rubber (sheeted) and 5 ounces of sulphur, are mixed and dissolved in 10 gallons of naphtha. A somewhat similar paste cement is 10 pounds of Majunga rubber (sheeted) and 20 gallons of naphtha. Where it is necessary that the cement shall not stain, as in cementing shoes of white leather to canvas, a paste cement is made of East Indian pale crêpe, 20 pounds, to 50 gallons of naphtha.

FOR SHOE REPAIR.

Shoe repairers use cements to patch leather shoes. By skiving the patch down to a thin edge, and cementing, a much neater job is done than in the now almost obsolete way of stitching the patch on. For such purpose either one of the channel cements or welting cements mentioned above are suitable.

RUBBER HEEL CEMENTING.

For attaching rubber heels and soles a special cement is recommended, which is made as follows: gutta percha (finely cut), 20 parts; ammonium sulphide, 18 parts; benzol, 3 parts; and turpentine, 24 parts. This combination is dissolved by shaking in a container at a slightly warm temperature, after which 35 parts of finely-powdered asphalt are added, and the closed container thoroughly shaken for several days. This cement, which has a syrupy consistency, is warmed by immersion of the container in boiling water, and applied to the leather surface, properly prepared for it; then the sole or heel is laid on and subjected to a heavy pressure. A second cement for this purpose, which dries more quickly than the above, is made in two solutions, equal parts of each being mixed together at the time of applying. One solution contains 20 parts of finely cut gutta percha and 80 parts of ammonium sulphide. The second solution is 20 parts of shellac, 2 parts of crude turpentine, and 70 parts of alcohol.

PRECAUTIONS NECESSARY.

Leather and rubber surfaces, to which rubber cements are to be applied, need special preparation to secure successful adhesion. Both should be roughened,—the leather, to produce a fibrous surface for the penetration of the cement; and the rubber, for the removal of any incrustation of sulphur or talc. If the leather is at all oily a washing of the buffed surface with benzol is recommended.

For use on leather which contains oil, a cement is manufactured which contains a percentage of talc, powdered soap-stone, whiting, or some similar substance. This absorbs the oil, and allows the cement to perform its function. These substances do not dissolve, but are held in suspension in the cement, which must be thoroughly agitated before applying. Such cement is particularly useful in turning in the skived edges of shoe uppers, to produce a smooth finish.

PATCHING RUBBER SHOES.

Shoe repairers are often called upon to patch rubber footwear. A cement made for this purpose is made of Para rubber, 20 pounds; rosin, 8 pounds, and turpentine, 80 pounds.

RUBBER BLACKINGS.

Two receipts for rubber blacking may be appropriately given in this connection. A rubber blacking formula recommended is: caoutchouc oil, 12 pounds; acetic acid, 12 pounds; vinegar, 12 pounds; molasses, 20 pounds; and lamp black, 44 pounds.

A liquid blacking contains caoutchouc oil, 4½ pounds; sulphuric acid, 12½ pounds; vinegar, 27 pounds; gum arabic solution, ¼ pound; molasses, 23½ pounds; bone black, 32 pounds.

What the Rubber Chemists Are Doing.

VULCANIZING BY ULTRA-VIOLET RAYS.

A FRENCH chemist, H. Olivier, has perfected the following method for vulcanizing rubber solutions by ultra-violet rays. The rubber solution, containing free sulphur, with or without certain organic or inorganic sulphides which are decomposed by ultra-violet rays, such as carbon bisulphide, allyl sulphide, or antimony sulphide, passes from a hopper on to an endless steel band, which is carried by guide rollers round the greater part of the periphery of a mercury vapor lamp. The lamp is surrounded by a double, hemicylindrical water-jacket of quartz, in order to cut off heat rays. The time of exposure is quite short, in order to avoid the deleterious effect of prolonged exposure to ultra-violet radiation on the rubber. As an example, a layer of solution a fraction of a millimeter thick, at a distance of 5 centimeters from the lamp, which is operated at 220 volts and 3 amperes, requires an exposure of about 40 seconds. After passing the lamp the solution is removed from the endless band to a receiving vessel by means of a scraper.

AGING TESTS.

C. Beadle and H. P. Stevens have tested the keeping quality of vulcanized material, from rubber prepared after the manner proposed by B. J. Eaton of the Department of Agriculture of the Federated Malay States, who suggested the treatment of rubber coagulum with caustic soda, sodium carbonate, or lime, to obtain a product having a very rapid rate of cure. The result of the test made by Beadle and Stevens shows that such rubber when vulcanized deteriorates on keeping, and sooner or later "perishes."

A series of experiments, conducted by C. D. Kratz, on accelerating vulcanization by increasing the temperature, leads to the conclusion that if a compound is correctly vulcanized the temperature at which it is vulcanized in no way affects its aging properties, and the author decides that it is therefore safe to increase the temperature of vulcanization (within reasonable limits) for the purpose of increasing output, provided that the highest temperature which may be employed corresponds with the shortest time capable of definite measurement under the conditions of vulcanization.

PLASTIC SUBSTANCES.

The war has necessitated the economy of such volatile solvents as ethyl alcohol and ether for use in the manufacture of explosives. In 1914 Henri Barthelemy, of Paris, published a study of this subject (See THE INDIA RUBBER WORLD, March, 1915, page 324). In a recent issue of "Le Caoutchouc & la Gutta Percha" he reverts to the subject from a mathematical point of view. He finds it practicable to recover at least 50 per cent of these solvents from the air containing them. Two systems are available for the purpose. One of these is the Claude process, which depends on heat absorption by expansion of the air in molecular contact with the solvents. The other is the ordinary system of refrigeration by machines using ammonia or carbonic and sulphuric anhydrides.

Each method has advantages and disadvantages. The Claude is simple and economical of space, with low freezing efficiency, while the other system is more complicated, occupies more space, but is more effective.

The well-known French rubber chemist, André Dubosc, has recently discovered a new process for separating pure rubber from combined sulphur in reclaimings. He is said to be now perfecting the industrial application of this discovery.

METHODS OF ANALYSIS.

BARIUM CARBONATE IN VULCANIZED RUBBER.

THE method of J. B. Tuttle for the determination of barium carbonate in vulcanized rubber is as follows: One gram of the rubber is placed in a porcelain boat and ignited in a current of carbon dioxide in a glass tube. The residue is finely ground, treated with 5 to 10 grams of ammonium carbonate, 15 to 20 cc. of strong ammonia, and 50 cc. of water, and boiled for 15 to 20 minutes, to convert lead sulphate into carbonate. The insoluble matter (barium sulphate and carbonates of lead, barium, calcium and zinc) is filtered off, washed to remove soluble sulphates, and treated with 10 cc. of glacial acetic acid and sufficient water to make the total volume 100 cc. The solution is heated to boiling and filtered. Lead is removed from the solution by precipitation as sulphide, and the barium then determined as sulphate. This gives the barium present as carbonate, and the barium present in the rubber as sulphate is obtained by the difference.

CHEMICAL TREATMENT OF RUBBER.

THE UNITED STATES.

PRODUCING SUBSTANCES RESEMBLING CAOUTCHOUC. The process consists in polymerizing isoprene in the presence of from 2 to 5 per cent of isoprene ozonide. [Henry S. A. Holt and Gerhard Steinnig, assignors to Badische Anilin & Soda Fabrik, Ludwigshafen, Germany. United States patent No. 1,189,110.]

PROCESS OF RECLAIMING RUBBER. The waste rubber is heat-treated with protein in the form of an albumin. [Harold B. Murdock, Assignor to Rubber Regenerating Co., both of Naugatuck, Connecticut. United States patent No. 1,189,282.]

RECLAIMING RUBBER WASTE. The process of reclaiming rubber waste containing lead and sulphur by adding a reactive substance such as zinc sulphate, to form, with the sulphur and lead respectively, a light colored water-insoluble sulphide and a light colored water-insoluble lead salt, and converting the lead sulphide into the said light colored sulphide, and lead salt, through the action of the reactive substance (zinc sulphate). [Harold E. Murdock, assignor to Rubber Regenerating Co.—both of Naugatuck, Connecticut. United States patent No. 1,189,721.]

THE UNITED KINGDOM.

PROCESS AND APPARATUS FOR COAGULATING LATEX. Latex is supplied to tubes provided with longitudinal slots, arranged at top of a chamber into which a coagulating vapor or gas, such as carbon dioxide or smoke, is admitted. The latex flows from the slots on to a series of inclined glass or other plates, arranged vertically one below the other, in such a way that the uncoagulated latex from the top plate is received by the second plate of the series, and so on. The plates are in parallel pairs, pivoted about a horizontal shaft, so that when a layer of sufficient thickness has been formed on the upper plate of a pair, the pair can be rotated through 180 degrees to enable the under plate to receive the latex. By this method it is possible to separate the rubber from a given latex into different grades or qualities. [W. G. ten Honte de Lange, Jr., Bandoery, Java, and C. Bosman, Haarlem, Holland. British Patent No. 10,382 (1915).]

THE FRENCH REPUBLIC.

PROCESS AND APPARATUS FOR TREATMENT OF LATEX. Latex is placed in shallow aluminum trays (about 50 by 20 centimeters) to a depth not exceeding 2 centimeters, and the trays are packed on shelves in a chamber. A charge consists of

350 trays. Smoke, previously cooled, is passed through the chamber from a smoke generator for about 20 minutes, after which communication between the chamber and the chimney is closed, and the passage of the smoke into the chamber continued for about an hour and a half. The progress of the coagulation is observed through a glass window, and the chamber is kept closed for half an hour after the coagulum has shrunk away from the sides of the trays. The smoke is then allowed to escape, the chamber opened, the trays are allowed to stand for two hours, and the serum is poured off. The coagulum is transferred to a large tank of water, in which it is left over night, the sheets of rubber are washed with changes of water, and each sheet is then exposed to sunlight for one to two hours, after which it is lightly pressed in an iron or wooden mold and allowed to dry in the air for five or six days. [F. Ripeau. French patent No. 477,238, June 5 (1914).]

APPARATUS FOR VULCANIZATION BY ULTRA-VIOLET RAYS. See note preceding. [H. Olivier. French patent No. 477,204 (June 3, 1914).]

OTHER CHEMICAL PATENTS.

THE UNITED STATES.

1,189,549. Binding and coating composition. Carleton Ellis, Montclair, N. J., assignor to Ellis-Foster Co.

1,189,550. Coating composition. Carleton Ellis, Montclair, N. J., assignor to Ellis-Foster Co.

1,187,869. Method of making plastic compositions. Konstantin Tarassoff, Moscow, Russia.

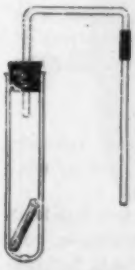
UNITED KINGDOM.

2,669 (1916). Rubber substitute. G. M. Boddy, 8 Leadenhall street, London, England.

LABORATORY APPARATUS.

HYDROGEN SULPHIDE GENERATOR FOR INDIVIDUAL USE.

WHEN small amounts of hydrogen sulphide are desired the generator shown in the illustration will be found very convenient. As described by H. A. Noyes, the apparatus is essentially two ordinary test tubes, one of which just slips inside the other. Blow a small hole in the bottom of the smaller tube, insert a stick of ferrous sulphide, close the open end with a one-holed rubber stopper that has been fitted with a delivery tube.



To use: Fill the larger tube about one-third full of dilute acid and slip the smaller tube down into the acid. Gas is generated and conducted directly to the solution to be tested. When through using, the inner tube is quickly raised, stopper removed and the delivery tube and test tube washed out under the tap. This serves as a very satisfactory apparatus for individual use for the generation of small amounts of hydrogen sulphide. It is extremely simple and can be kept "ever ready" in the test tube rack.

A CRUCIBLE "FORK."

This little device, credited to H. G. Parker, of William Jewell College, Liberty, Missouri, has proved very practical and convenient. It was designed for the use of students, but may appeal to chemists in general. The fork is made of stout aluminum wire. The prongs of the fork enclose slightly more than a semicircle and should be bent to fit the crucible used. The space between the ends of the prongs should be large enough to pass around the crucible when supported on a tripod, but small enough to prevent the crucible from slipping out when the fork is lifted. When properly adjusted the crucible is held very securely.

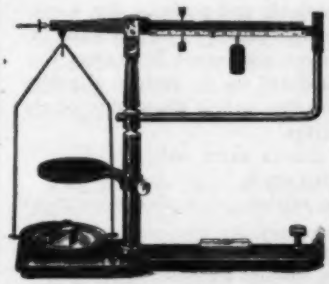
A HIGH TEMPERATURE BURNER.

The Scimatco laboratory burner illustrated below produces a short, wide flame that is uniformly hot, and the coolest part of it is hotter than the hottest part of a Bunsen flame. The extremely high temperature of the flame of this burner is due to perfect mixture, maximum speed and the preventing of back-firing by the special design of the burner. The latter feature consists in the use of a grid of pure nickel 3/8 inch thick, placed at the top of the tube.

For many purposes the burner replaces the blast lamp, with a saving of 98 per cent in gas and the elimination of expense, and noise of the blast. The non-reducing flame of the Scimatco burner is particularly suited for heating platinum ware, as it prolongs the life of the metal tenfold over that possible with the ordinary blast burner. [Scientific Materials Co., Pittsburgh, Pennsylvania.]

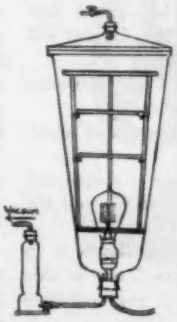
SPECIFIC GRAVITY BALANCE.

The illustration shows a very conveniently arranged triple-beam balance for general chemical use, and for taking specific gravities. Weighings are obtained by movement of the riders along the beams. These riders are easily handled and quickly placed in notches, but cannot be removed from the beams. An adjustable support is provided for holding a vessel of water in the case of specific gravity weighings. The three beams are placed in the same horizontal plane. Capacity of the middle beam is 100 grams by 10 gram divisions; back beam, 10 grams by 1 gram divisions; front beam, 100 centigrams by 1 centigram divisions. Total capacity, 111 grams; sensibility, 1 centigram. [Voland & Sons, New Rochelle, New York.]



VACUUM DESICCATOR.

The "home-made" vacuum desiccator devised by Dr. Percy A. Houseman, shown in the illustration, has proved very practical in drying materials *in vacuo* above room temperature. The apparatus is made from a percolator fitted with a desiccator lid.



The temperature at which the sample is dried may be regulated by varying the height above the electric bulb of the glass triangles attached to the tripod.

Replete with information for rubber manufacturers—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

LABORATORY APPARATUS PATENT.

UNITED STATES.

1,190,085. Viscosity testing apparatus. Hans F. Bauer, Cedar Rapids, Iowa.

SELECT METHODS OF ANALYSIS OF GOLDEN SULPHIDE OF ANTIMONY.

GOLDEN sulphide of antimony, or antimony pentasulphide, is a product of prime importance for the vulcanization of many rubber articles, notably for automobile inner tubes and surgical sundries.

The preparation of antimony pentasulphide is very delicate and if the different phases are not conducted with every required precaution, there is risk that a product will be obtained which will possess none of the qualities required in rubber manufacture. Pure pentasulphide of antimony is both an orange red pigment and a vulcanizing agent. It is capable, at the ordinary temperatures of vulcanization, of partially decomposing, with the liberation of 2 molecules of sulphur, becoming reduced to the red or trisulphide of antimony.

According to the method of its preparation, it is capable of carrying more or less free sulphur, besides antimonious acid, antimoniates, red trisulphide, oxysulphides of antimony and of sulphate of lime.

Besides these substances, which are legitimate impurities of manufacture, there may be found flowers of sulphur, added mechanically, vermilion or red sulphide of mercury and oxide of iron added to produce a tone.

Before using it one should submit it to a thorough analysis to determine its exact contents of free sulphur and actual pentasulphide.

True golden sulphide should contain only antimony and sulphur. It should be neutral or slightly alkaline. If it is acid, its color deepens, loses its clearness and becomes maroon. This defect of acidity is one by which one is able to detect hurried manufacture and insufficient or hasty washing.

It should be very nearly impalpable and perfectly dry, a condition difficult to attain, except by vacuum drying process, because the drying temperature must not exceed 70 degrees C.

Various methods have been proposed for the analysis of golden sulphide, and some of them readily furnish knowledge of the commercial products on the market.

They are summarized below:

FREE SULPHUR

To use intelligently a golden sulphide, it is always necessary to know its free sulphur.

Herbst's Method.—A known weight of pentasulphide is extracted in a Soxhlet by freshly distilled sulphide of carbon for 8 or 10 hours. The sulphur solution is transferred to a tared beaker, evaporated on a water-bath and sulphur weighed after drying in an oven at 100 degrees C.

Weber's Method.—Ammonia dissolves the pentasulphide of antimony at a moderate temperature. Antimony oxide and free sulphur are insoluble.

A quantity of golden sulphide is dissolved in concentrated ammonia, gently heated on a water-bath, thrown on a tared filter and the residue washed with ammonia until the filtrate will no longer precipitate pentasulphide by acidifying.

The insoluble residue is dried at 60 degrees C., and extracted for 6 hours with freshly distilled sulphide of carbon.

The residue on the filter is practically antimonious acid which can be dried and weighed.

The bisulphide of carbon used for the extraction is evaporated on a water-bath, the residue is dried at 60 degrees C., and the sulphur weighed.

This method is long, but if the pentasulphide dissolved in ammonia is reprecipitated by acid, filtered and dried, one is able to determine by the same analysis the free sulphur, pentasulphide and antimonious acid.

COMBINED SULPHUR.

Caspari's Method.—The analysis is made on a half gram sample from which the free sulphur has been removed by carbon bisulphide. The extracted antimony sulphide is added gradually into 5 cc. pure nitric acid in an Erlenmeyer flask and the mixture cooled by immersion in water. The antimony is thus completely oxidized, but a certain quantity of the sulphur remains in the form of yellow masses. The flask is then slowly heated by immersion in boiling water, care being taken to guard against the fusion of sulphur. From time to time a pinch of potassium chlorate is added, until all the sulphur has disappeared.

The mixture is then transferred to a dish and evaporated to dryness.

The residue is taken up in 400 cc. of boiling water, with addition of a little tartaric acid, to keep the antimony in solution. The sulphuric acid formed is determined, in the usual way, as barium sulphate.

ANTIMONY.

Caspari's Method.—The determination of antimony should be conducted on a sample from which the free sulphur has been extracted, because it otherwise prevents the solution of the antimony sulphide in the acids. One-half gram of sulphur-free pentasulphide is dissolved in 10 cc. of hydrochloric acid and the sulphureted hydrogen expelled by boiling; 2.25 grams of tartaric acid and 200 cc. of water are added and the whole boiled. Any residue of silica should be filtered from the solution on a tared filter, dried and weighed. The antimony tartrate in the filtrate is precipitated as antimony sulphide by a current of hydrogen sulphide. The antimony sulphide is transferred to a large porcelain crucible and 3 cc. nitric acid is added to it. The crucible must be covered to prevent loss.

When the action is over, the mass is evaporated until dry, by immersion of the crucible in boiling water; then a few drops of nitric acid are added to the residue and the crucible is heated, first, slowly, over a small flame, then more powerfully, to expel the sulphur and the acid, and, lastly, calcination is effected. The antimony present is weighed as SbO_4 and calculated as pentasulphide.

WATER.

Moisture is determined by drying 10 grams of pentasulphide either in a vacuum oven or in an ordinary oven in a current of nitrogen at a temperature not exceeding 60 degrees C. The percentage of moisture present should not exceed one per cent.

VERMILION.

The pentasulphide is totally soluble in ammonium sulphide without the application of heat, while vermilion is not soluble. In this manner these two substances can be separated.

After washing, the vermilion precipitate is dried and weighed.

If a commercial golden sulphuret contains pentasulphide, red trisulphide and vermilion, an aliquot part is first treated by cold ammonium carbonate which dissolves the trisulphide and leaves the pentasulphide and the vermilion. Then the residue is treated with cold ammonium sulphide which dissolves the pentasulphide and leaves the vermilion.

RUBBER COMPOUND TO REPLACE SEALING WAX.

A patent has been recently granted for a material that is flexible, adhesive and an excellent substitute for common sealing wax. It is composed of the following ingredients:

	Grams.
Resin (colophony)	350
Pure rubber	300
Naphtha	100
Sulphur	100
White lead (dry)	200

For coloring, 40 grams of vermilion are added. The resin is first dissolved in a copper vessel and the other ingredients then added and the whole well stirred over a hot fire. The melted mixture is then poured into molds and when cool, the cakes are removed and allowed to cool for 24 hours on a marble slab. [Ramon Castello, Provenza 240, Barcelona, Spain. British Patent No. 7,703 (1915).]

New Machines and Appliances.

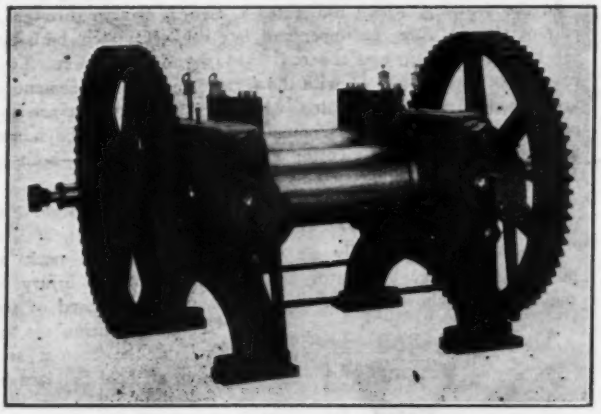
THE M. & W. HEAVY DUTY REFINING MILL.

THE mill embodies a number of improvements that are unquestionably of great advantage in mills of this type.

The illustration here shown represents a 14 by 20 by 30-inch, heavy duty double geared refining mill. It is of massive construction, the weight being distributed to adequately resist the heavy strains to which refiners are subjected. The housings are of the end cap type, made of semi-steel iron and provided with broad feet, which insure rigid attachment to the foundation plates. The end caps are cast steel and the cap bolts are made from chromium vanadium steel, making the completed housing capable of withstanding the heaviest strains.

The rolls are made of the best chilled iron, cored and fitted with stuffing boxes, water and steam connections for controlling the temperature of each roll. The roll bearing boxes are cast steel and bushed with phosphor-bronze, a pocket being provided to accommodate a quantity of grease, and sight-feed oil cups are also provided for stimulating the grease, thereby insuring proper lubrication. The roll guides are cast iron with telescoping tee irons that fit the radius of the roll to the lowest possible point.

Another feature is the telescope gap guard fastened to the boxes and frame, completely covering the openings at the inside of the housings and preventing particles of rubber and other ma-



terials from getting into the bearings and gearing, resulting in considerable saving of materials as well as affording a protection to the lubrication.

The roll adjusting screw has a coarse, heavy pitch and is made of chromium vanadium steel. The bronze adjusting screw nut interlocks with housing so that it can be removed or inserted from the outside. The adjusting screw wrench is a special double-acting ratchet wrench and has a number of advantages, such as a time saver in adjusting the rolls (it being always in position for use), as well as the convenience with which adjustment can be made, as the operator can locate the lever to suit his convenience. [Morgan & Wright, Detroit, Michigan.]

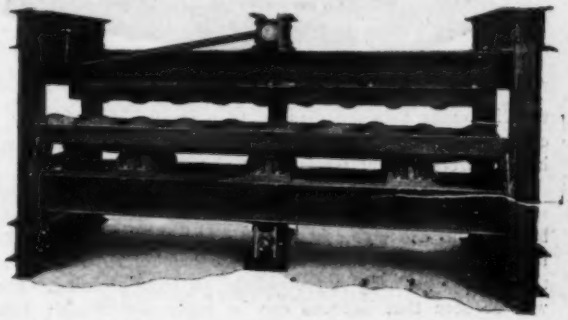
DYKES' RELINER MOLD AND VULCANIZER.

A machine that dispenses with all cores and wrapping and cementing operations necessary in the old method of making reliners, patches and inner shoes, is illustrated herewith. It combines in one machine both shaping and curing, the former by hydraulic pressure and the latter by heat directly applied.

The frame and bed are solidly built of I-beams to withstand deflection common to hydraulic presses of this type. The lower platen carries the male reliner mold and is raised and lowered by three hydraulic rams. The upper platen is rigid and carries the female mold.

To make a complete reliner, the material is placed longitudinally on the lower mold and pressure applied to the rams which raise the lower platen and force the molds together. Heat is then admitted to the molds and in ten or twelve minutes the cure is complete and the reliner is ready for the stock room.

One man can operate two machines and easily turn out 200 reliners a day. By doubling up—that is, molding "two on" for each heat—the capacity can be increased to 400 reliners; depending on the length of cure. In making patches, material for 18 is placed on the mold of each machine. Allowing one hour for 5

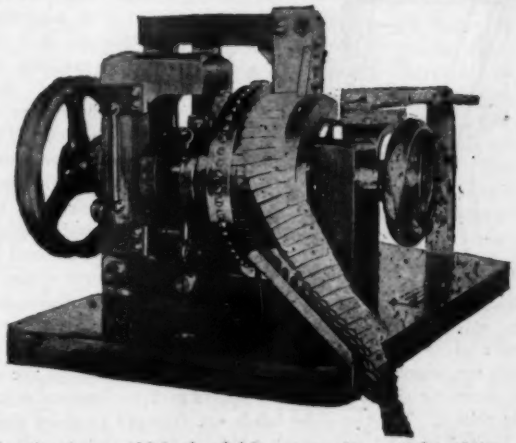


heats, the result will be 50 heats a day and the product, 1,800 complete patches. The machines are made in five sizes for 3-inch to 5-inch reliners and special size for patches, double hock shoes, lace and clincher boots. [The Dykes Tire Shoe Machinery Co., Chicago, Illinois.]

THE WILLS RUBBER EDGING PLAITER.

This machine was designed with the object of producing plaited edgings from strips of rubber sheet. That it is practical in construction and efficient in operation is evidenced by the accompanying illustration showing the machine in operation.

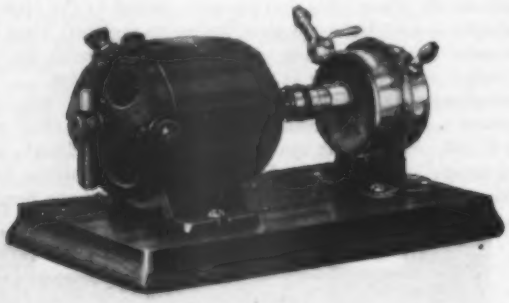
It is compactly built and mounted on a substantial base that may be fastened to any convenient bench or table. The strips of rubber are delivered from the feed table to the horizontal



plaiting head, on which the folds are made, and the plaits permanently cemented together. The machine is belt driven and will finish 30 inches of plaiting per minute. [Arthur Jackson Wills, North Brookfield, Massachusetts.]

TOY BALLOON INFLATING MACHINE.

The popularity of toy balloons as an advertising medium continues to grow remarkably, and manufacturers experience difficulty, not in securing orders, but in filling them. As these balloons are invariably supplied in a deflated state, the question of inflating several thousand of these little toys is rather perplexing unless one is familiar with the usual procedure The accompanying illustration is the answer. It is, in fact, a small



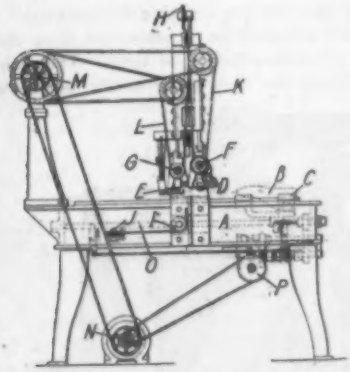
electric motor attached directly to a small rotary blower, and can be placed on a table or desk and operated from an alternating or direct current service.

The neck of the balloon is slipped over the nipple that is seen in the picture, extending from the opposite side of the blower, and the motor started. When the balloon is inflated, the air is shut off by means of the hand valve and thread is tied around the neck to prevent the air from escaping. Thus it will be seen that balloons can be easily and cheaply inflated. The motor consumes current at the rate of an ordinary 16-candle-power lamp, revolving the blower at 1,500 revolutions per minute. [Dependable Manufacturing Co., Chicago, Illinois.]

MACHINERY PATENTS.

PERRAULT'S SOLE LAYING MACHINE.

ACCORDING to this method, the layers of sole stock are superimposed and simultaneously subjected to a rolling pressure and a vibratory movement imparted by vertically reciprocating rollers. At the same time, the shoe is moved at right angles to the plane of reciprocation of the rollers.

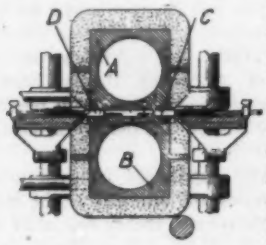


In the accompanying illustration, *A* is the bed of the machine and *B* the last and shoe to which the rubber sole is to be applied. The last is mounted on a carriage *C* that travels back and forth under the vertical rollers, and is driven by a reversible lead screw. The first roller *D* is a straight-faced pressure roller operating on the central part of the sole. Following this, a pair of rollers *E*, arranged at an angle of 15 degrees, contact with the edges of the sole. These rolls are journaled in yokes, the upper ends of which are carried by eccentric shafts *F* and *G*, that impart a vibratory motion to the rollers. The two yoke heads are fastened to slides that have a limited vertical movement within a frame that is raised by a cable which passes over the top sheave *H*, then down and around sheaves *I* and *J* journaled in the bed of the machine. Here it is connected to a bell crank lever that is tripped by the forward movement of the carriage, and lifts the reciprocating rollers from the sole on the return movement of the carriage.

The eccentric shafts *F* and *G* are driven by belts *K* and *L* from the countershaft *M*, that is in turn driven from the motor shaft *N* which also drives the carriage operating screw *O* by means of gearing shown at *P*. The return movement of the carriage is effected by a clutch operated by a pivoted fork and rod that coöperates with a lug attached to the carriage. A hand lever holds the clutch in neutral position and stops the carriage to permit the removal of the last and the replacement of a new one to be operated on. [J. E. Perrault, Belmont, assignor to Hood Rubber Co., Watertown—both in Massachusetts. United States patent No. 1,184,990.]

VULCANIZING BRUSH BRISTLES SET IN RUBBER.

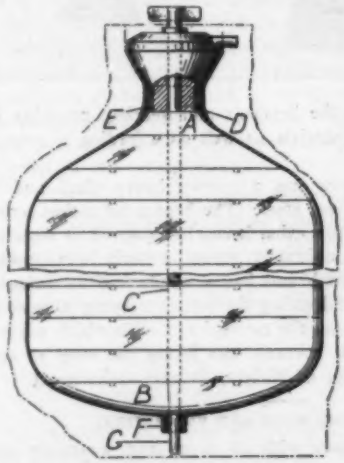
This machine is designed to heat and vulcanize the rubber cement used to secure together the butt-ends of brush bristles. It accommodates a number of brushes of different sizes, and supplies pressure and heat at the particular point desired. The machine is constructed with six platens, arranged in pairs, one above the other, the upper platen of each pair being raised or lowered by separate vertical screws operated by hand wheels. The platens are all chambered for steam and the connections provided with swing joints to allow for vertical movement.



In the drawing, which illustrates a vertical section through a pair of platens, *A* is the upper and *B* the lower platen, both being heated by steam and covered with asbestos insulation. Two rows of brushes *C* and *D*, with the ferrule ends rubber cemented, are placed on the lower platen, when pressure and heat are applied until vulcanization is complete. [M. P. Tottle, Glyndow, assignor to William A. Tottle & Co., Inc., Baltimore—both in Maryland. United States patent No. 1,189,212.]

COLLAPSIBLE CORE FOR HOT WATER BOTTLES.

A core that can easily be removed through the neck of molded hot water bottles or similar goods, without injury to the article, is shown in the illustration. It is composed of ten sections, *A* being the top and *B* the bottom section, all held in place by a rod *C*. The neck of the bottle is provided with a round plug *D*, through which the rod *C* passes, and fits within the threaded stopple ring *E* that is molded in the bottle neck. A recess at the lower part of the mold forms a nipple *F* for attaching a syringe tube, and *G* is a recess for centering the end of rod *C* in the mold. The operation is as follows: The sections of the core are assembled, being held in position by the rod, and the two mold halves are lined with calendered stock, the core inserted and the mold parts clamped together in the usual manner. After being cured, and when the mold is sufficiently cooled, the bottle is removed from the mold, and the rod and plug are withdrawn. This frees the top

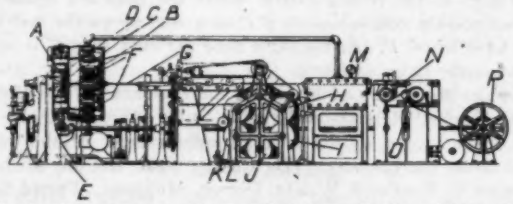


core section *A*, which is removed by slightly stretching the neck of the bottle. The other sections are removed in a similar manner, after which the bottle is trimmed and finished. [E. Stahl and W. Klein, assignors to Goodyear's India Rubber Glove Manufacturing Co.—both of Naugatuck, Connecticut. United States patent No. 1,188,693.]

SUBER'S FABRIC STRIP MACHINE.

Cotton yarn is interwound and laminated upon a mandrel by this machine, forming a tube that is afterward impregnated with rubber, collapsed in band form, and then dried and wound up on a reel. These strips are used for building tire fabric, making rubber hose, belting and other rubber products.

The drawing is a side elevation of the machine. The four reels, *A*, *B*, *C* and *D*, rotate one within the other, the alternate reels revolving in opposite directions, and are supported by the standard *E*. Upon each reel is mounted a number of spools *F*, containing the yarn elements which are interwound around a centrally located hollow mandrel by the rotation of the reels.



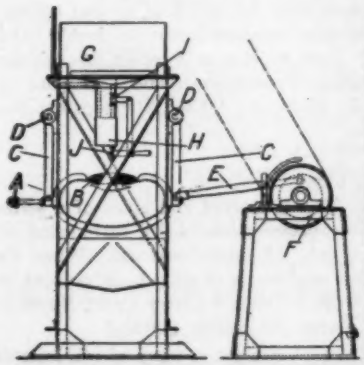
The band passes over the mandrel through the solution chamber, and is shown at *G*, being fed to the drying roller *H*, and drums *I*, *J*, *K* and *L*. After passing over the drying rolls the band is carried through the chamber *M*, in which the solvents are recovered and then led through stretching rollers *N*, *O*, and finally wound up on the reel *P*. [L. A. Subers, Cleveland, Ohio. United States patent No. 1,188,571.]

In a more recent patent Subers provides a machine that impregnates the strands of yarn separately, prior to forming them on a mandrel, into a hollow band, and at a relatively larger angle than heretofore employed. [L. A. Subers, Cleveland, Ohio. United States patent No. 1,189,751.]

DAVIDSON LATEX COAGULATING CHURN.

According to this invention, the latex is churned to and fro in an oscillating cradle, the coagulant being added to the latex at the same time.

The illustration shows a side elevation of the machine, which is constructed of angle iron and strongly braced to support the working parts. The cradle *A* has upwardly curving ends, giving it a somewhat kidney shape in longitudinal section. The central part is open to receive the latex and coagulant, and a screen *B* is provided on the side from which the mother liquid is poured. The cradle is attached to four links, two of which, *C C*, are shown, pivoted to the frame at *D D*. The oscillating motion is obtained by the pitman rod *E*, connected to the belt-driven crank disk *F*.



The coagulant tank *G* is connected to the auxiliary tank *H* that holds a quantity of coagulant, bearing a definite relation to the quantity of latex to be coagulated in the cradle. The two valves *I* and *J* are connected so that when one is open the other is closed; thus when the bottom valve is closed and the upper one opened, the auxiliary tank is filled. When the top valve is closed the lower one opens, and the coagulant drips into the cradle and mixes with the latex.

In operation the latex is poured into the cradle to about one-third its capacity, the machine set in motion and the coagulant allowed to gently flow into the rocking cradle. When coagulation is complete the machine is stopped and the mother liquid poured out through a screen by tipping the cradle to one side, and the rubber is emptied from the other side into a deflecting chute that leads into a suitable receptacle. [S. C. Davidson, Belfast, Ireland. United States patent No. 1,189,351.]

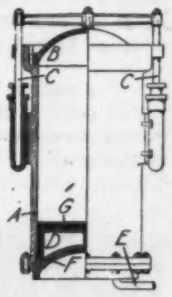
BATHING CAP PLAITING MACHINE.—A circular disk of sheet rubber is plaited and the plaits permanently cemented on this machine, which also operates on half and quarter disks and those with the center cut away. [F. F. Brucker, assignor to Miller Rubber Co.—both of Akron, Ohio. United States patent No. 1,186,374.]

HALE'S APRON FEED FOR MILLS.—The apron is maintained in a taut condition when moved out of contact with its driving roll and in the inoperative position it is supported so that it will not fall into the pan or obstruct the front roll. [B. O. Hale, assignor to Farrel Foundry & Machine Co.—both of Ansonia, Connecticut. United States patent No. 1,189,444.]

NEW TIRE MACHINES.

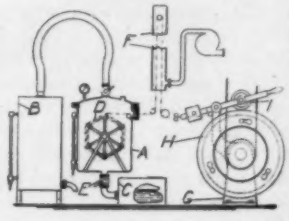
A RAMLESS PRESS VULCANIZER.

THE steam chamber *A* of a hydraulic press vulcanizer serves also as the ram cylinder, and the upper cover *B* is raised by rams *C*, *C*. Water is admitted to the lower side of the piston *D* through a pipe *E*, and in its lowest position the piston is supported by a flange *F*. To reduce condensation, the upper part of the piston is covered with metal and asbestos sheets *G*. [J. H. Nuttall and D. Bridge and Co., Castleton, Manchester, England. British patent No. 978 (1915). This patent was briefly described in THE INDIA RUBBER WORLD, July 1, 1915.]



KUENTZEL'S BEAD FORMING MACHINE.

Endless straight side and clincher tire beads are made of threads or cords impregnated with rubber by a continuous winding process, on the machine here described and illustrated. In the drawing, *A* is the vacuum chamber, *B* the condenser that produces the vacuum and *C* the rubber solution tank. The thread or cord is arranged on a reel *D*, journaled on bearings within the vacuum tank. When the valve *E* is opened, the partial vacuum causes the solution to flow from the tank into the vacuum chamber, submerging all or part of the reel of thread.

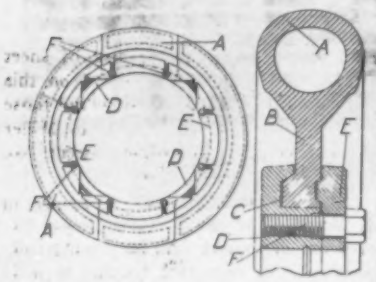


The impregnated cord then passes out of the chamber, through a drying apparatus *F*, to the bead-forming machine *G*. This consists of a short belt-driven shaft journaled in a suitable frame with an annular bead mold *H* keyed to the outer end. A lining of frictioned fabric is placed in the groove of the bead mold, the end of the impregnated cord is adhered to the lining, and the mold revolved until sufficient cord has been coiled to

form the bead. During the winding operation the hand-operated pressure roller *I* is introduced into the groove of the bead mold, firmly compacting the threads. The finished bead is released from the mold by detaching the outer ring. [C. Kuentzel, assignor to The Republic Rubber Co.—both of Youngstown, Ohio. United States patent No. 1,187,339.]

COLE'S COLLAPSIBLE CORE.

The rapidity with which tire casings are made depends to a great extent on the core, with relation to easy manipulation, and facility in removal from the vulcanized casing.



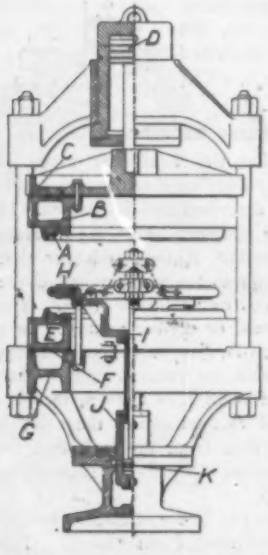
The drawing on the left is a front elevation, and on the right is an enlarged cross section, of a new collapsible core. The four core segments indicated by *A* are provided with the usual web *B*, terminating on the inner circumference with a projection *C*, that fits the groove in the outer annular clamping ring *D*.

When the core segments are assembled on the ring, they are held in alignment by the four plates *E*, that are clamped by eight bolts *F*.

When the casing is removed from the mold, after curing, the bolts are simply loosened and the plates withdrawn inwardly, which permits the removal of the core segments from the interior of the shaft in the usual manner. [J. C. Cole, assignor to Fisk Rubber Co.—both of Chicopee Falls, Massachusetts. United States patent No. 1,189,192.]

A FRENCH PRESS VULCANIZER FOR TIRE CASINGS.

This press is characterized by the arrangement of its controlling parts and the method of extension and retraction of the divided core.



The illustration shows on the right a perspective view of the press and on the left a vertical section.

The upper mold *A* is carried by a heating table *B*, which is attached to the platen *C*, that is operated by the hydraulic ram *D*. The lower half of the mold *E* rests on a heating table *F*, supported by the stationary bed-plate *G*. The core *H*, divided in segments, is supported by a plate *I* that is fixed to the ram *J*. This is hollow and acts as a cylinder for piston rod *K*, which is provided, at its upper end, with connecting links that control the extension and the retraction of the core segments.

The operation of the apparatus is as follows: To bring the upper platen *C* into the position it occupies in the illustration, pressure is introduced under the ram *D*. To release the core *H* from the lower part of the mold, pressure is introduced under ram *J*. Finally, to bring about the retraction of the core segments, the piston rod *I* is raised and the segments converge towards the center.

When the press is in this position, the casing is placed on the core and the segments extended. It is then lowered in contact with mold *E* and pressure applied by the upper part of the mold *A*. Thus the casing is molded and vulcanized. It is then removed and the operation repeated. [A. Wolber. French patent No. 477,474 (June 17, 1914).]

MACHINES FOR REELING BIAS FABRIC STRIPS FOR TIRES.

The old method of placing bias fabric strips used for tire building between the muslin leaves of a "book" is apparently obviated by this new invention. Referring to the illustration, *A*

is an elevation of the delivery end of a bias shear, and *B* indicates the delivery belts. *C* is the side elevation of one of six reeling machines that are placed alongside the shear, with sufficient space between them for the six operators. As the cut strips are advanced by the traveling delivery belts of the shear, they are removed by the operators to the reeling tables, where the ends are spliced together and the continuous strip *D* is wound up on the reel *E* by the hand wheel *F*. At the same time the liner strip *G* is wound between the strips of fabric.

Besides the saving of labor and the avoidance of the troublesome "books," it is claimed that a better splice is obtained by this method, due to the superior adhesiveness of the rubber fresh from the calender. [De Courcy Neal, Detroit, Michigan, assignor to Morgan & Wright, Detroit, Michigan. United States patent No. 1,189,724.]

TIRE BUILDING MACHINE. This automatic machine stretches and applies the fabric to the core smoothly, imparting an eccentric movement to the smoothing rollers that are mounted on a vertically swinging arm. [A. Mathern, Zollikon near Zurich, Switzerland. United States patent No. 1,186,591.]

TUBULAR TIRE FABRIC LOOM. A tubular endless fabric, composed of single or multiple interwoven plies, is woven on this loom without stretching, pulling, packing or otherwise distorting the weave. [F. S. Dickinson, New York City. United States patent No. 1,188,418.]

CORD OR STRIP WRAPPING MACHINE. The core is rotated and the spools of material, mounted on the ends of two arms that revolve in opposite directions, apply the strip or cord circumferentially, beginning at the sides and continuing toward the middle of the core, where the two series of convolutions meet. [J. H. Coesir, Joplin, Missouri. United States patent No. 1,189,666.]

TIRE FLAP TRIMMING MACHINE.—The ragged excess material known as "flash" is trimmed from the tire flaps by two endless band cutters that operate in a manner similar to double band saws, severing the "flash" from the flap as it passes through the machine. [Thomas Midgley, Worthington, Ohio. Assignor to Morgan & Wright, Detroit, Michigan. United States patent No. 1,190,315.]

THE UNITED KINGDOM.

INNER TUBE MANDREL. This is tapered and made of a series of transverse cardboard or papier-maché disks, surrounded by and supporting a tapering tube of similar material. When the tube has been spliced, the mandrel is dissolved, or reduced to pulp, by water or steam. [F. H. Hall, 6 Livery street, Birmingham, England. British patent No. 16,890 (1915).]

WIRE CORE FOR SOLID TIRES. A straight or wavy wire is inserted within the coils of the wire core before the rubber is forced or molded around the core. [Thomas Gare, Wembly, Middlesex, England. British patent No. 8,228 (1915).]

AIR-FILLED STUDS FOR SOLID TIRES. The hollow rubber studs are stiffened at the base by notched metal rings that are incorporated in the tire and vulcanized with it. [E. B. Killen and the Commercial Tire Co. British patent No. 11,070 (1915).]

RUBBER THICKNESS GAGES FOR CALENDERS. Right and left hand gages are arranged on each side of the calender, so that the edges of the sheet pass between the calipering rollers and the measurement is read on the gage dials. [C. J. Beaver and E. A. Claremont—both of Cheshire, England. British patent No. 14,582 (1915).]

OTHER MACHINERY PATENTS.

THE UNITED STATES.

1,181,354. Machine for cutting off beads. W. C. Stevens, assignor to Firestone Tire & Rubber Co.—both of Akron, Ohio.

1,181,355. Universal chuck. W. C. Stevens, assignor to Firestone Tire & Rubber Co.—both of Akron, Ohio.

1,181,639. Core-carrying stand. F. F. Brucker, assignor to The Miller Rubber Co.—both of Akron, Ohio.

1,181,692. Repair vulcanizer. J. B. Stroud, Pass Christian, Miss.

1,188,004. Collapsible core. T. Midgley, Sr., and T. Midgley, Jr., Lancaster, Ohio.

1,188,091. Inner-tube tire mold. T. W. Morris, assignor of one-half to G. B. Dryden—both of Chicago, Ill.

1,188,538. Casing repair spreader. J. J. Greene and A. A. Weber, New York City.

1,189,487. Gasket and washer cutter. C. Roth, New Philadelphia, Ohio.

1,190,372. Machine for chopping chicle gum. B. W. Brown, Roselle Park, N. J.

1,190,432. Tire forming apparatus. J. T. Lister, Cleveland, Ohio.

1,190,433. Tire forming apparatus. J. T. Lister, Cleveland, Ohio.

1,190,596. Stretch measuring device for testing machines. H. L. Scott, Providence, R. I.

1,190,597. Testing machine. H. L. Scott, Providence, R. I.

THE UNITED KINGDOM.

3,110 (1915). Inserting rubber and like studs in soles, etc. H. T. Stephens, Tahoona, Ferryside, South Wales.

*3,727 (1915). Paper wrapping machine for tires. L. W. Goold, 5 Corporation street, Birmingham. (Pierce Wrapping Machine Co., Chicago, Ill.)

THE FRENCH REPUBLIC.

*479,631 (September 1, 1915). Improvements in cores used in the making of tires. J. H. Coffey and J. H. Coffey, Jr.

PROCESS PATENTS.

1,187,564. Laminated, cohesive, interwound fabric band, bonded and tessellated. L. A. Subers, East Cleveland, Ohio.

1,187,890. Rubber impregnated fabric and process for making the same. R. G. Dunwody and J. W. Wills, Atlanta, Ga.

1,189,866. Process of making rubber footwear. F. E. Payne, assignor to Goodyear Rubber Co.—both of Middletown, Conn.

1,189,936. Method of making rubber bands. B. B. Goldsmith, New York City.

1,189,938. Method of making rubber bands. B. B. Goldsmith, New York City.

1,190,087. Engine or machine packing and method of making the same. G. W. Beldam, Ealing, England.

1,190,261. Method of making vulcanized rubber articles. H. G. Blanchard, New York City, and F. Duesler, Cleveland, Ohio, assignors to The Mechanical Rubber Co., a corporation of New Jersey.

1,190,292. Process of making hose. A. T. Hopkins, Cleveland, Ohio, assignor to The Mechanical Rubber Co., a corporation of New Jersey.

1,190,510. Process of forming articles from plastic materials. W. J. Burns, assignor to The Peerless Vulcanite Co.—both of Bridgeport, Conn.

1,190,731. Hollow rubber article and process of producing same. N. D. Crawford, Elizabeth, N. J., assignor to The Mechanical Rubber Co., a corporation of New Jersey.

THE UNITED KINGDOM.

3,402 (1915). Utilizing waste rubber. G. W. Beldam, Boston Lodge, Ealing, and A. U. B. Ryall, Glamorgan House, Windmill Road, Brentford—both in Middlesex.

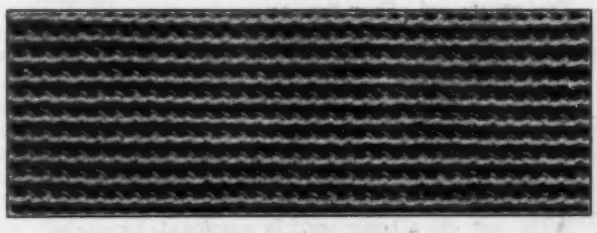
THE TRAUTVETTER BIAS FABRIC AND LOOM.

IN the early days of hose pipe bicycle tires, many fabric weaves were designed, with the object of producing a perfect tire. Among the many examples of weaves introduced was the Goodyear rivet fabric, well known at that time.

A modified form of this fabric, especially designed for motor tire building, has been recently perfected and a special loom constructed for its manufacture. Both fabric and loom are protected by patents, the latter being manufactured and sold by the inventor, William G. Trautvetter, Patterson, New Jersey.

RIVET BIAS FABRIC.

The fabric is regularly made of right cabled, soft yarn, and consists essentially of ground warp threads, bias or diagonal reinforcing threads and the usual filler threads. The ground

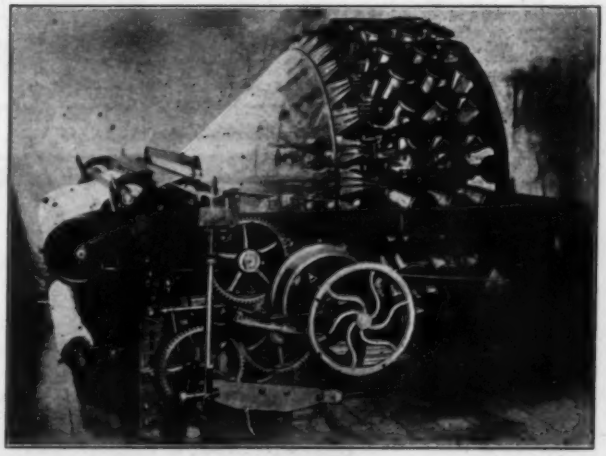


TRAUTVETTER BIAS TIRE FABRIC.

warp threads are arranged lengthwise, parallel to each other, and the sets of reinforcing threads extend diagonally across the fabric in opposite directions from one selvage to the other and return, so that the bias threads cross each other between the adjacent picks and also at the top of the warp threads, which pass over the filler threads, while the bias threads pass under them. The bias threads cross each other under the filler so that the warp threads, the bias reinforcing threads and the filler threads are compactly interwoven, forming a strong and durable fabric, capable of withstanding strains in any direction. The small openings formed in the weave are filled with rubber and the adjacent threads completely embedded by the calendering operation, thus forming thousands of small rubber rivets that serve to prevent separation of the fabric plies when built up in a tire and vulcanized.

BIAS FABRIC LOOM.

The loom which makes this fabric embodies several novel features in construction that are of interest. For instance, the reel and harness are quite different from those of the ordinary



TRAUTVETTER BIAS FABRIC LOOM.

loom. The warp threads unwind from a warp beam journaled in the lower rear portion of the frame, and the bias threads unwind from spools journaled in a revolvable reel that is mounted on the top of the frame, while the filler threads are supplied by a shuttle mechanism and are beaten up against the fabric by an ordinary lay.

British Standard Solid Tire Rims.

THE pioneer work in connection with the standardization of solid tire rims in Great Britain was undertaken by a select committee of the Society of Motor Manufacturers and Traders, Limited. From data obtained from the wheel and tire manufacturers it was found that there were 173 wheel diameters in use, all more or less closely approaching one another. The data were analyzed, and by a careful process of elimination it was found possible to reduce the number to 6 standard sizes, and at the same time cover practically all the requirements of the commercial motor industry, and these were finally adopted as British standards by the Engineering Standards Committee, the body which fixes and regulates British mechanical standards.

The task was a heavy one. It was found, for example, that where the suitable size of tire might be 900 by 120 millimeters [35.43 by 4.72 inches], the correct size of rim, as quoted by five of the principal manufacturers, was 719.8 millimeters [28.32 inches], 721 millimeters [28.39 inches], 740 millimeters [29.13 inches] and 742 millimeters [29.21 inches].

Further simplicity was afforded by dropping all reference to the outside diameter of the tire; every standard size being designated by the diameter of the rim on which it fits, together with the dimension for the width of the base.

The official report of the Engineering Standards Committee reads, in part, as follows:

1.—SIZES OF RIMS.

British Standard Solid Tire Rims for Automobiles shall be made to the outside diameters given in column 1 of the table, and shall measure at a temperature of 60 degrees F. not less than the minimum circumferences given in column 2 and not more than the maximum circumferences given in column 3.

1. Standard Outside Diameter.		2. Minimum Circumference.		3. Maximum Circumference.	
Millimeters.	Inches.	Millimeters.	Inches.	Millimeters.	Inches.
*670	26.38	2,104.9	82.83	2,107.9	82.95
720	28.35	2,262.0	89.06	2,265.0	89.17
*741	29.17	2,327.9	91.65	2,330.9	91.73
771	30.35	2,422.2	95.35	2,425.2	95.47
850	33.46	2,670.3	105.12	2,673.3	105.23
881	34.69	2,767.7	108.94	2,770.7	109.06

*The Committee recommends that for general use these sizes be dispensed with.

2.—MINIMUM WIDTH OF STEEL RIMS.

Where no raised flange is used the width of the rim shall be such as to provide not less than 10 millimeters [.3937 inch] overhang on each side of the wheel beyond the tire base (see Fig. 1).

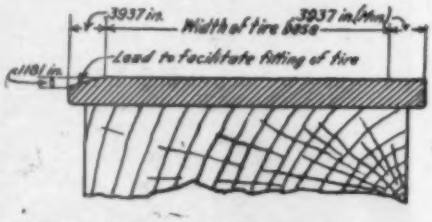


FIG. 1. STEEL RIM ON WOOD FELLY.

3.—LEAD TO FACILITATE FITTING OF TIRES.

A lead of 10 mm. [0.3937 inch] wide and 3 mm. [0.1181 inch] deep (See Figs. 1 and 2) shall be provided on one edge of the rim to facilitate the fitting of the tires.

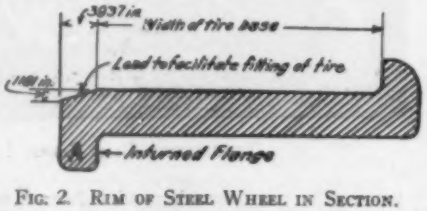


FIG. 2. RIM OF STEEL WHEEL IN SECTION.

4.—SLOTS TO FACILITATE REMOVAL OF TIRES.

In case of steel rims having fixed raised flanges the Committee recommends that the slots to facilitate the removal of tires (see Fig. 3) be spaced at equal intervals, round the rim and be not less than 100 millimeters [3.937 inches] in width. For rims up to and including 771 millimeters [30.35 inches] in diameter the slots shall be four in number, and for rims above 771 millimeters [30.31 inches] in diameter the slots shall not be less than four in number and have a combined length of not less than 600 millimeters [23.62 inches.]

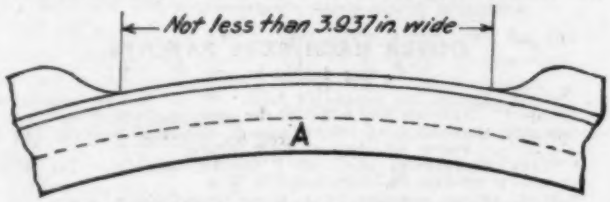


FIG. 3. SIDE ELEVATION OF FIG. 2 SHOWING SLOT.

5.—INTURNED FLANGE, OR PAD SUPPORTS FOR STEEL BLOCKS USED FOR REMOVAL OF TIRES.

The Committee recommended that either an inturned flange (A, Figs. 2 and 3), or suitable pads or rests, spaced at equal intervals around the rim, be provided for the support of the steel blocks used in removing the tires.

6.—MARKING OF RIMS.

The rims of all wheels for solid tires which purport to comply with the British standard outside diameters and limits for circumference laid down in Clause 1 of this report, shall be marked on the external surface of the rim (as shown in Fig. 4) with the standard outside diameter (Column 1), and also with the letters B, S and the Committee's brand as *prima facie* evidence adduced by the manufacturer that the rims are in accordance with the diameters and limits laid down in Clause 1. The letters shall be not less than 10 millimeters [0.393 inch] high and the arrangement of the marking shall be as shown in Fig. 4.

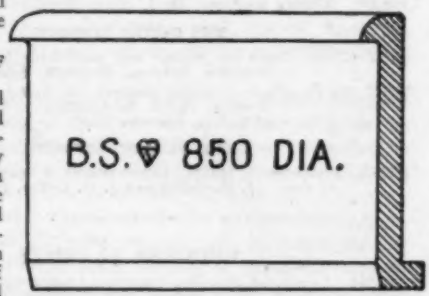


FIG. 4. EXAMPLE OF STANDARD MARKING FOR RIM.

7.—MARKING OF SOLID TIRES.

The Committee recommends that every solid tire be marked on both sides, in such a manner as to indicate clearly the width of the tire base and the diameter of the standard rim it is intended to fit; for instance, "120 for 850" [4.72 for 33.46 inches] would indicate a tire 120 millimeters [4.72 inches] wide to fit an 850-millimeter [33.46 inches] diameter rim. The figures are to be molded on the tires, immediately following the marker's name, in the position shown in Fig. 5 and to be not less than 10 millimeters [0.393 inch] high.

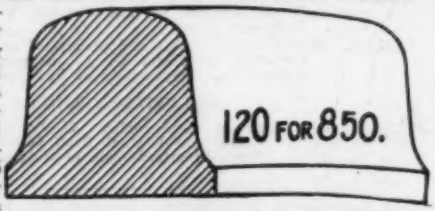


FIG. 5. EXAMPLE OF STANDARD MARKING FOR SOLID TIRES.

A study of the table of standard rim sizes, given in the above report, shows that the limit of accuracy to which the wheels must be turned, and the tires bored, is fairly fine, taking into consideration the class of work. Such accuracy is justified, however, under the circumstances. It should be remembered that

these tires must be pressed on so tightly as to remain in place under severe side thrusts delivered while the vehicle, and consequently the wheels also, are subject to considerable vibration, which naturally tends to loosen the band from the felly.

It will further be noted that in deciding upon the widths of wheel rims, care was taken to arrange for ample safeguard against damage being done to the tire, whenever the wheels run against the curb. In case of flangeless rims, a minimum of 10 millimeters [.3937 inch] is to be left projecting at each side of the tire. Where a flange is provided at one side, this allowance is demanded on the opposite edge of the rim. The edge of the rim is tapered to allow easy entry of the wheel into the tire.

In order that support may be offered for the steel blocks used when removing the tires, it is recommended that an inturned flange be provided; failing that, suitable pads or rests, spaced at equal intervals round the rim, would suffice.

AEROPLANE TIRES.*

NOW that increased attention is being given to the employment of aeroplanes as aids in national defense, it is interesting to note the part that tires play in their use. Aeroplane motors, like automobile motors, must be protected from jolts by pneumatic tires. In the earlier days all sorts of makeshifts were used; even bicycle tires were pressed into service on some of the pioneer machines. Some builders went so far as to use full size automobile tires. These were equal to the occasion as far as reducing the shock of landing was concerned, but were far too heavy and offered too much wind resistance.

The old type of aeroplane tire was costly and uncertain. Present day necessity has compelled tire dependability, as machines are now larger and heavier and must carry more passengers and heavier loads.

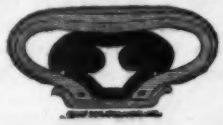
The development of tires to fit the peculiar requirements of the aeroplane began about five years ago. It was early discovered that resiliency was an important factor—that a live, springy tire actually aided the machine to get off the ground and helped to absorb the shock of landing. Experiments were made with cord construction, with the result that cord tires for aeroplanes have been refined to a point of efficiency equal to that of its successful big brother for electric and gasolene cars.

On aeroplanes, tires of large cross section are used to provide maximum cushioning ability to resist the lateral thrusts that occur when the machine side-swipes the earth in landing. On machines used for scouting in war, the cross section size is reduced one inch to reduce weight, thereby permitting the carriage of an additional amount of gasolene.

*By E. R. Preston, Aeronautic Dept., The Goodyear Tire & Rubber Co.

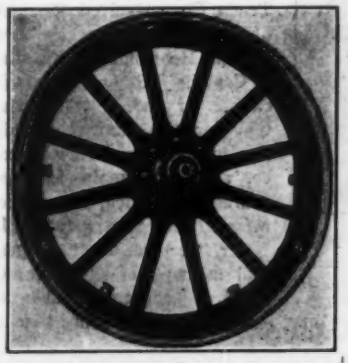
THE COMPRESSION INNER TUBE.

This type of inner tube is designed along new lines of construction with the object of avoiding pinching, rim cuts and puncture troubles. It is extra thick and molded from Upriver fine stock, the diameter being larger in its normal cross section than that of the casing. The first illustration shows the tube in its normal position in the casing, before inflation. When inflated, as shown in the second illustration, the excess diameter and molded construction of the tube, it is claimed, produces radial compression that effectively closes an ordinary puncture when the object is withdrawn. When fully deflated, the tube occupies a folded position apparent in the illustration that permits a car of ordinary weight to run a limited distance on the rim without injury to the casing or tube. It is said that the heavy walls of the tube require less air pressure and prevent the majority of blow-outs. While these tubes are more expensive than the ordinary inner tube, the extra service and immunity from tire troubles are said, by those who have used them, to be worth the difference in price. [Compression Inner Tube Co., Louisville, Kentucky..]



THE PARKER DEMOUNTABLE RIM AND WHEEL.

Two patents of interest to the rubber tire industry were granted recently to Orrel A. Parker, manager of the Hydraulic Pressed Wheel Co., Cleveland, Ohio. The most important in relation to tires covers a rim that apparently avoids the Perlman claims by providing four simple bolts and two clamps, the former exerting a radial and the latter a lateral pressure in attaching the rim to the felly of the wheel. Dowel pins are provided on the rim opposite the locking devices to take the thrust of the drive.



The second patent provides means for attaching the rim directly to the spokes of an all-metal wheel. In this, the alternate spokes are provided with radial locking screws and lateral clips of substantially the same construction as those set forth in the principal patent.

The illustration shows the application of the Parker demountable rim to a wooden wheel of the ordinary type.

MONTHLY TIRE EXPENSE.

That tire expense is one of the large items in the cost of operating a motor car is generally conceded. But accurate average figures are difficult to obtain, due to the great variety of cars and the varying conditions under which they are operated. Exact figures, therefore, are interesting.

The Automobile Club of America has recently accumulated data on the cost of operating large town cars, shown in the following table, in which the monthly tire expense is given:

It would seem that these figures are excessive; however, the weight of the cars and the fact that they were driven by chauffeurs must be considered.

COST PER MONTH OF OPERATING LARGE TOWN CARS.

	A 51 HP	B 38 HP	C 38 HP	D 32 HP	E 25 HP	Average	Per Cent of Total Cost.
Miles traveled	883	903	862	1,005	590	848	
Fuel consumed, gallons	175	141	147	121.5	119	140.7	
Cost of fuel at 30 cents a gallon	$52.50	$42.30	$44.10	$36.45	$35.70	$42.21	27.6
Cost of lubricants	2.17	1.59	.87	2.73	.....	1.45	.9
Tire expense	54.95	50.91	39.31	48.78	33.89	45.57	29.9
Insurance	17.14	29.13	10.35	13.80	7.47	15.58	10.2
Storage	40.00	40.00	40.00	40.00	40.00	40.00	26.2
Supplies, license fees	13.66	4.14	3.54	15.36	2.76	7.91	5.2
Total	$180.42	$168.07	$138.17	$157.12	$119.82	$152.72	100.0

Demountable Motor Trucks.

THE idea of flange wheels and steel flanges fitted over regular wheels, permitting a motor truck to travel on railroad tracks, is not new.

There were, however, only two such devices worthy of attention and their value is limited, owing to the time and trouble necessary to change a truck over from solid tires to flanges.

One of these devices is a flange wheel, made similar to a regular railroad wheel, which replaces the regular truck wheel. A truck so equipped must change wheels every time it leaves the rails or leaves the road for the rails.

The other is an endless flange rim, made to fit over the S. A. E. band, and is applied by hydraulic pressure the same as the pressed-on type tire. To use this flange it is necessary to remove the tires, and it is also necessary to employ hydraulic pressure of not less than 25 tons.

FIG. 1. ONE-HALF OF THE FLANGE.

Neither of the above mentioned devices are practical for military purposes, and consequently are of no value to the army.

In May of this year Mr. Wales of the Riker Motor Truck Co. conceived the idea of making a flange in two pieces. He submitted his idea to Captain J. R. Lee, who is in charge of motor transportation for the punitive expedition at Columbus, New Mexico, and as Captain Lee encouraged the idea, Mr. Wales referred the matter to A. L. Riker, vice-president and general manager of the Locomobile Co. of America, who designed a sufficient number of flanges to equip one truck and sent them to the army base at Columbus.

Upon the arrival of the flanges Captain Lee equipped a three-ton Riker truck with them, and ran the truck over the tracks of the El Paso & Southwestern Railroad from Columbus to El Paso and return, a distance of 146 miles, without any trouble whatever. The truck carried a crew of 20 men, each man being equipped with complete field equipment, and ran on regular railroad schedule, with a railroad conductor in charge, as an extra train, at an average speed of 18 miles per hour. The gas consumption for the entire trip was practically the same as would have been the case had the truck been driven for the same distance over paved streets, and the only noticeable difference in the running of the truck was in the vibration. This vibration was due entirely to the motor, and was slightly in excess of the motor vibration in traveling on the streets. Up to a speed of 19 miles this vibration was harmless but of such force as to prohibit a greater speed.

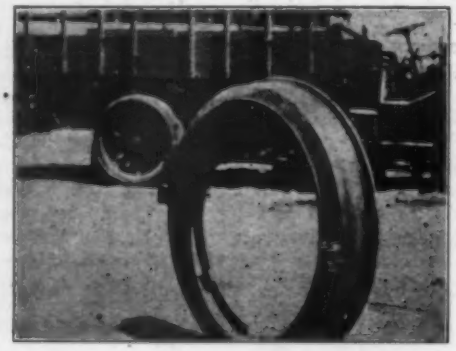


FIG. 2. THE FLANGE COMPLETE.

Another noticeable feature was the fact that the truck ran better loaded than empty, on account of traction, for with an empty truck there was considerable slippage.

Of the illustrations, Fig. 1 shows one-half of the flange. Fig. 2 shows the flange complete, while Fig. 3 shows a truck equipped and ready for service on a railroad. The flange is so constructed as to fit over the tire with the inside edge resting on the steel base or steel fastenings of the tire. In case of a dual wheel the inside edge of this flange rests on the center wedge ring. It does not come in contact with the tire or wheel at any other point. Two bolts are then fitted at each joint and drawn up tightly, which causes the edge of the flange resting on the center or inside flange of the wheel, to be drawn up with sufficient pressure to eliminate all danger of creeping.

In starting the experiment at Columbus, the truck was driven up to the railroad track, the flanges were applied on all four wheels in 30 minutes' time, requiring four men. The truck was then driven on the track, and on arrival in El Paso, the truck was stopped at a street intersection and the flanges removed in 16 minutes, thrown on the truck and the truck driven over the streets to the hotel. In the opinion of Captain Lee, who conducted this test, these flanges are a complete success, their superiority over other devices of a like nature being the fact that it is not necessary to remove the wheels nor tires to apply them. Their value to the army cannot yet be estimated, but the fact that these trucks can be operated over bridges and road-beds where heavy locomotives would break through, and also the fact that on encountering washouts, these flanges can be removed, and the truck driven around the obstruction, all with a minimum amount of expense and time, practically assures that they will be used by the United States army more extensively than anyone realizes at this time. It is hardly possible that they will ever be used on the main lines of any railroad except for rapid transportation of troops on emergency calls. Their chief field of operation will be on branch lines, or lines constructed to suit the convenience of the army. Each truck of three-ton capacity will carry 30 men fully equipped for field service.

FIG. 3. TRUCK EQUIPPED WITH THIS DEVICE ON TRACK.

The weight of these flanges is about 250 pounds each. They are made of cast steel. In case they were made of pressed or rolled steel this weight would be reduced easily 50 per cent.

Should be on every rubber man's desk—Polyglot Rubber Trade Directory, 1916; Crude Rubber and Compounding Ingredients; Rubber Country of the Amazon.

New Goods and Specialties.

RUBBER WATCH PROTECTOR.

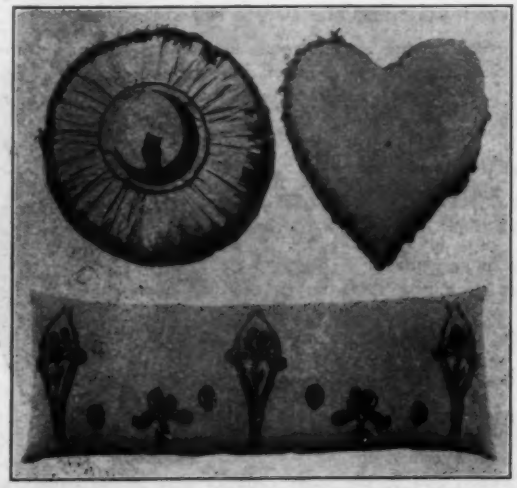
ELECTRICAL workers, mechanics, firemen, trainmen, locomotive and steamship engineers, sportsmen, automobilists, miners, millmen and farmers will find in these rubber cases a neat and convenient protection for their watches.

For electrical workers a protective watch covering is an absolute necessity, and the one shown in the first illustration is especially designed for this purpose. Being made entirely of rubber, the case affords perfect insulation against electricity. It covers the watch completely, stem and all, and the corrugations on the back of the case, shown herewith, prevent the watch from slipping out of the pocket. This case is attached by removing the ring from the stem of the watch and pushing the stem through the neck of the rubber case, adjusting the watch so that it fits snugly in the protector. The ring is then replaced and the watch chain snapped to the rubber.

In attaching the non-stem rubber case, also shown, the ring of the watch need not be removed. This style of case is useful for those who do not come in contact with electricity, but desire to protect their timepieces from dust, dirt, or water. [Allproof Watch Protector Co., Oakland, California.]

RUBBERIZED BATHING ACCESSORIES.

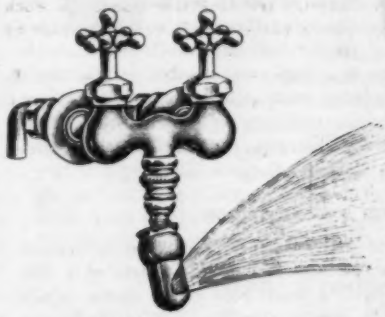
Sea-bathing today calls for many accessories, if one follows the dictates of fashion. Besides the bathing suit, the cap to cover the hair, and the shoes, the fair sojourner on the beach now



requires cushions on which to recline while taking the air and sun-bath on the sands before or after the sea-bath. And the fashion is to have these cushions elaborate in material and make-up. The need of water-resisting qualities in such pillows has resulted in the use of rubberized mummy-silk of various colors, brilliant hues predominating, the figures or designs being of solid color, cut from this cloth and cemented or applied over the basic material. Three pillows of this character are shown, all of which are proving popular as novelties at the fashionable watering places. [L. C. Studios, New York City.]

HORIZONTAL SPRAY WITH RUBBER BALL.

A small opening in the rubber ball at one end of the perforated metal cap, in the bathtub spray device here illustrated, is forced up over the spigot, when the temperature and pressure of the water may be regulated with the hot and cold water cocks. A horizontal shower or needle bath is thus furnished, without wetting the head, although, if desired, it is also an effective shampoo spray. This attachment, which measures scarcely two inches in length, may be easily carried by tourists and traveling men, and affords a great convenience in all homes not equipped with stationary showers. [John Howard McElroy, Chicago, Illinois.]



NOVEL VACUUM CLIP.

A novelty in vacuum hangers is the combination with it of a spiral spring, which assists in creating the vacuum to enable it to attach more firmly than would the rubber cup alone, and also relieves direct tension upon the neck of the cup. This cup also has an inner core, which, it is claimed, adds still further to the adhesion. To this is attached a spring clip which will hold firmly anything from a sheet of paper to a curtain stick, and the main purpose for which it is recommended is to hold a curtain so that it will not flap in the wind, if the window is open. However, this is only one of many uses for the "Put-me-on" as it is called. It can be used to suspend show cards or small articles in store windows, or brushes and toilet articles in the boudoir or bath room, or special memoranda on the office desk. It is small and inexpensive, and is efficient in many ways which will suggest themselves in the household, store or office. [Knight & Christensen Co., Chicago, Illinois.]

THE McDERMOTT HYDRAULIC FORCE CUP.

In the drain pipe provided for all sinks and wash basins there is necessarily a trap, and in this, organic waste matter collects, gradually filling up the pipe. The McDermott hydraulic force cup is designed to enable the householder to remove this accumulation, and thereby save both plumbers' bills and—through prompt eradication of an unsanitary condition—doctors' bills as well. This force cup is similar in appearance to those operated by air pressure, but a rubber hose is attached to the water faucet—fitting any size—and the force of the water is utilized to clean out the pipe. [John McDermott, New York City.]

RUBBER LIFT FOR LOUIS HEELS.

While rubber heels and half-heels are plentiful, and of various shapes and sizes, their use has been confined mainly to broad heeled shoes. It was not until recently that any endeavor was made to give to wearers of women's high heeled shoes the advantage of resiliency, soft tread and non-slip qualities, which such heels afford. Now, however, rubber heel lifts are made expressly for the Cuban and Louis heels which are so fashionable today. The cut shown is a "Maltese Cross" special size heel made expressly for this purpose, the cut being the exact size of the base of the heel lift, which is attachable to either wood, leather or fiber heels by three screws, which, being countersunk below the surface of the lift, allow play for the resiliency of the rubber, thus affording the elastic tread so desirable in such goods. [Gutta Percha Rubber, Limited, Toronto, Ontario, Canada.]

RUBBER HOSE PROTECTOR.

A novel attachment for garters, which is claimed to prevent drop stitches even in the thinnest stockings, consists of a thin rubber disk, with a small hole in the center, which allows it to be slipped over the stud of the garter, lying directly over the base plate. In this manner the sharp edges of the metal parts of the garter are cushioned and prevented from cutting the threads of the stocking. The disk need never be removed except for cleansing, which can readily be accomplished with soap and water. [No-Tear Hose Protector Co., Portland, Maine.]

"UNIQ" RUNNING BOARD FOR FORD CARS.

The running board here shown is built on a sound wood base, specially treated to prevent warping or swelling. It is covered with heavy corrugated rubber, the edges being bound with heavy aluminum or brass moldings securely fastened with nickel-plated or brass screws. A full set of bolts is furnished with each pair of boards, and each bolt is covered with a shell of aluminum or brass, so that it cannot rust and spoil the appearance of the car. The "Uniq" running boards greatly improve the looks of the car, and are claimed not to rattle, rust nor sag in the middle, as do the iron boards. [The C. Spiro Manufacturing Co., New York City.]

RUBBER LINED TOBACCO POUCH.

The pipe or cigarette smoker appreciates the convenience of a well-made tobacco pouch, and manufacturers produce many varieties, each having its distinct and individual merits. A new pouch is made of fine quality leather, with a snap button as fastener. The special feature of this pouch is its rubber lining, which enables it to retain the moisture of the tobacco, thus keeping it in the proper condition to give the most enjoyment to the smoker. This "Sportsman's Tobacco Pouch," as it is called, is made in tan and black leather and is an article which should find ready sale, in those stores which carry a line of smokers' articles. [H. J. Collis Manufacturing Co., Taunton, Massachusetts.]

RUBBER CEMENTED BRUSH.

The brush for automobile painting or varnishing and similar uses, shown herewith, is guaranteed by the manufacturer to withstand the most severe usage and remain intact until entirely worn out. In its manufacture, the butts of bristles or hair in these brushes are saturated with pure plastic rubber in a semi-liquid state and then vulcanized, thus firmly attaching them to the handle of the brush and eliminating the defects present in the ordinary brush, which cause annoyance in painting and varnishing. [John L. Whiting-J. J. Adams Co., Boston, Massachusetts.]

A RACQUET GLOVE.

The tennis player knows the value of a first class racquet, and well understands the advantage of keeping the most vulnerable part, the stringing, in proper condition. No player can do good work with a flabby, loose-stringed racquet, and unfortunately the gut strings lose their effectjveness if allowed to absorb dampness. To properly preserve the racquet, and to protect the stringing from moisture, a "racquet glove" has been placed on the market. This is shown in the illustration. It is of fine quality cloth, coated with Para rubber. It is shaped to fit the racquet and is provided with a strap, which has a snap fastener. [Nathan Novelty Manufacturing Co., New York City.]

AUTOMATIC ELECTRIC SWITCH FOR AUTOMOBILES.

The usual practice in automobile electric wiring is to protect the batteries against grounds or short-circuits by installing a fuse on each circuit. The blowing of a fuse invariably occasions annoyance to the motorist who is obliged to find the fuse block, often placed where it is hard to get at, locate the fuse which has blown—not always an easy matter—and put in a new fuse, providing he has one available.

The automatic lighting switch here illustrated combines the functions of a lighting switch and overload circuit breaker, and in the latter capacity acts as the usual fuse block, instantly breaking the circuit when a ground occurs, and positively indicating such a breakage by throwing out a small button which is visible underneath the lighting switch control key. To again close the circuit it is merely necessary to push the button in, and if it remains in this position, it is certain indication that normal conditions are restored.

A similar automatic switch is marketed for ignition circuits, also a combined ignition and lighting switch, working on the same principle. Both of these are designed to prevent the draining of the battery, should the driver neglect to throw the switch off when the engine is stopped.

The bases of these ingenious devices are made of molded hard rubber with the terminals embedded in the same material, thus insuring perfect insulation. [Hartman Electrical Manufacturing Co., Mansfield, Ohio.]

FORD REAR WIND-SHIELD.

Protection from cold winds, dust and dirt has long been afforded the driver of an automobile by front wind-shields. The accompanying illustration shows a rear wind-shield which gives the same protection against the elements for the passengers that the driver enjoys. This convenient addition to the comfort and pleasure of motoring is made of heavy rubber cloth with transparent partitions, and may be readily attached to the top, and to the back of the front seat by special fasteners. [The J. P. Gordon Co., Columbus, Ohio.]

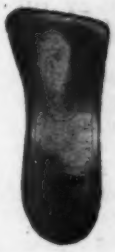
AN INTERCHANGEABLE RUBBER HEEL.

Few people wear the heels of their shoes uniformly—some wear down the outside of the heel, others the inside, while almost everyone wears off the back of the heel rather than the level tread. Rubber heels when worn down lose their resiliency, of course, as the thickness of the rubber is reduced. Therefore it has been found desirable that the heels might be interchangeable, so that when worn off on one side they could be reversed from one shoe to the other, and thereby give longer service than would otherwise be possible.

A heel made for this purpose is shown in the illustration, both the upper and under surface being presented. When on the shoe it differs in no respect from any other makes of rubber heels. The application to the shoe, which also allows for the interchangeable feature, is explained by the pictures. A metal fastener is attached to the shoe, over which the heel is then sprung through its resiliency. The method of application is to lay the heel, with the fastener in place, upon the prepared leather heel; then a light blow on the rubber heel will cause the "dogs" or points on the fastener to mark the exact position in which the fastener is to be nailed. This fastener is then removed from the rubber heel and nailed securely in place. The rubber heel is then sprung over the fastener, and the concaved surface springs flat and seals the joint between the shoe heel and the rubber heel. Of course, it is a simple matter to remove such heels, and transfer them to the opposite shoes after they have been run down on one side. The heels cannot be pulled off accidentally and will not crowd or shift out of place. They are made in various sizes for men's and women's shoes. [The Nolan Rubber Co., St. Paul, Minnesota.]

ANTERIOR-METATARSAL ARCH SUPPORT.

Most arch supports are intended to raise the arch extending from the heel to the ball of the foot, and many and varied are their forms and composition. As is well known, there is another arch in the human foot, that across the ball, at the bases of the toes; in anatomical language, the anterior or metatarsal arch. A disarrangement of the bones of this arch is the cause of severe suffering. To overcome and remedy this a special arch is made. It is claimed that the construction of this support is such that adjustment may readily be made to fit the form or structure of the bones of the foot, by means of the pocket placed in the upper end of the support into which the user places the specially devised pad of rubber molded to conform with scientific accuracy to the natural contour of the anterior metatarsal arch. This arrangement enables the user to adjust the pad in the exact position which affords greatest relief. The contact of the rubber pad against the upper layer of soft, flexible leather and the bottom layer of felt, holds the rubber pad in the position in which it has been placed, and its use tends to bring the bones back to their proper position. [Nathan Novelty Manufacturing Co., New York City.]



RUBBER IN THE NURSERY.

The inventor of the rubber bib, besides sharing in the sure profits of the present, is in line for the promised reward to the benefactors of the little ones. The rubber bib is not a new article of manufacture. It is not improbable that it has been a source of comfort to babies since grown up to engage in its manufacture and sale; but it does contribute to a child's comfort, offering relief from the irritating effects of the frequent spilling of milk over the neck and chest. Neither is the nurse's rubber apron new, its practical utility having been for some time recognized. The styles shown in the illustration, however, are in new decorative materials, the effect being quite different from the bibs and aprons hitherto in vogue. [Currie, Thomson & Co., London, E. C., England.]

THE TREO ELASTIC GIRDLE.

This is a new elastic girdle. It is made entirely of a washable, porous, surgical woven elastic, boned front and back with rust-proof steels, the front ones being of the new French soft top variety. It is suitable alike for growing girls and adults, and for bathing and athletic, as well as ordinary wear. Each girdle has four hose supporter straps of firm, substantial elastic with padded loops and all-rubber buttons. This corset is made in various materials, in white and pink, and is from 7 to 16 inches in length. [M. W. Schloss Manufacturing Co., New York City.]

Replete with information for rubber manufacturers.—Mr. Pearson's "Crude Rubber and Compounding Ingredients."

The Editor's Book Table.

RUBBER PRODUCING COMPANIES—1916. COMPILED BY THE Mincing Lane Tea and Rubber Share Brokers' Association, Limited, and published by "The Financial Times," London, England. [Board covers. 8vo, 551 pages. Price 3s.]

THIS volume is a compendium of information regarding the 532 rubber-producing companies in the Middle and Near East giving, as it does, the capital authorized, the capital issued, acreage, production, dividends, profits, the secretaries, boards of directors and much miscellaneous information of interest to investors or planters. Besides these, there is a supplementary section covering companies in the Far East. There are also estimates for the current year and outputs to the beginning of May; details of new land to be opened up, the highest and lowest prices of shares for several years, a complete list of directors and secretaries of rubber companies. These facts and figures are in most cases official. The work is well printed and admirably arranged for quick reference.

TRACTIVE RESISTANCE TO A MOTOR DELIVERY WAGON ON Different Roads and at Different Speeds. By A. E. Kennelly and O. R. Schweig. Presented at the Annual Convention of the American Institute of Electrical Engineers, Cleveland, Ohio, June 27-30, 1916.

In this paper is given a complete report on an investigation of tractive resistances of urban roads to a motor delivery wagon equipped with solid rubber tires. The "tractive resistance" as used in this paper, includes still-air resistance, but does not include wind resistance and the resistances internal to the truck. The test truck is fully described, with its driving mechanism and the storage battery which supplied the motive power. The investigation involved test runs over definite lengths of road, at measured truck speeds, to determine the gross battery output during these runs; and laboratory tests to determine the overall efficiency of the truck between battery terminals and rear-wheel treads at speeds and loads corresponding to the road tests. The results included in the paper are (1) overall efficiency of truck mechanism and (2) tractive resistances of a number of typical urban roads. The components of tractive resistance for a typical road are also given.

RAILWAY EXPANSION IN LATIN AMERICA. BY FREDERIC M. Halsey. The Moody Magazine & Book Co., 35 Nassau street, New York. [Cloth, 8vo, 160 pages, illustrated. Price $1.50.]

While this book is avowedly written to interest capital in a line of investments which is unfamiliar, to most Americans, it is far from being a book of dry facts and statistics. Rather, it is an entertaining account of the origin and development of the principal railway systems in Central and South America, giving many facts of the mechanical and engineering difficulties as well as the climatic conditions which were overcome, and briefly outlining the history of each of these enterprises. The story of the Madeira-Mamoré Railway is given in detail, though no facts are presented which have not been covered by THE INDIA RUBBER WORLD. Mr. Halsey suggests that a number of the larger South American railway enterprises, controlled abroad, be invited to make formal application to list their securities on the New York Stock Exchange, believing that when American capitalists become acquainted with the Latin-American investment field, they will doubtless be able to finance various new projects in those countries, where hitherto European capital has predominated. The book is neatly bound, has 40 half-tone engravings and four maps, showing the extent and location of the South American railways.

THE LEGACY OF THE EXPOSITION. PUBLISHED BY THE Panama Pacific International Exposition, San Francisco, California. [Large vo, 200 pages.]

This book is a compilation of the opinions of over 700 well-known Americans regarding the great exposition which was held in San Francisco last year. The sentiments are many and varied; they come from commanding figures in politics, science, art, transportation, business and literature, and also include many from prominent American women, the whole forming a permanent record of the comments of leading minds as regards the exposition, in its various phases. It is a beautiful book, which will delight bibliophiles, it being very novel in its manufacture. It is printed on toned antique paper, sewed on tapes after the book-making art of four centuries ago. A ruled scheme gives separate panels for the body text, the running heads and the side heads, the type matter being black and the rules red, to match the hand-made paper of the covers, while the backbone is of unbleached linen with a Japanese vellum title.

NEW TRADE PUBLICATIONS.

THE B. F. Goodrich Co., Akron, Ohio, is publishing a series of route books for the use of automobilists and we have just received copies of those for New York and New Jersey, as well as one entitled "Electric Car Tours in New England." These books are carefully compiled and give a great amount of exact information valuable to anyone touring the sections covered. Each book contains a map of the territory, and this is followed by instructions regarding the routes from one point to another. The large cities are also mapped to show the ways of approach and exit, while each tour is also shown in the same way. The routes are given concisely and clearly, showing the direction and the number of miles between every two points on the route. Where the Goodrich company has erected road marker guide posts at the corners, these are indicated by a character showing the way to turn; this, of course, being in addition to the verbal directions. The New York route in the New York book has in its central pages an outline map of the state, showing the number of miles between each important point. It is a book of 160 pages, of convenient size to carry in the pocket, as are the others mentioned. Undoubtedly, these books, which are offered free to motorists, will have a large circulation.

The Goodrich Company is sending out to the shoe trade a finely printed pamphlet exploiting the new "Textan" soles and Goodrich heels for the shoe manufacturing trade. The illustrations are printed in natural colors, and folded within is a chart showing the shapes, sizes and thicknesses of the soles and heels described in the body of the work.

* * *

The Goodyear Tire & Rubber Co., Akron, Ohio, publishes a general catalog for dealers which gives a large amount of information regarding such goods as are usually carried by automobile accessory dealers and repairers. Many of the articles listed are illustrated by clean, clear half-tones, and a considerable amount of information regarding the goods and their methods of use, guarantees, etc., is added.

* * *

The Racine Rubber Co., Racine, Wisconsin, sends out a brilliantly colored folder advertising its tires, a portion of the circular showing a bird's-eye view of the plant, while a map of the United States has 37 cities indicated, at each of which there is a distributor of the Racine company's tires, the names of these distributors being given in tabular form below.

* * *

"Shoveling Coal by Machinery" is a 16-page pamphlet crowded full of information regarding the various methods

of handling coal by means of the conveyor belts made by the Link-Belt Co., Chicago, Illinois. The text is by Henry J. Edsall, M.E., and the diagrams and illustrations give one a very full and complete idea of the efficiency of these methods. A supplementary chapter deals with a conveyor for coal and ashes, also well illustrated.

* * *

William H. Scheel, New York City, importer and dealer in chemicals and specialties for manufacturers in various trades, has just issued a buyers' list, giving the complete line of products carried by him, some 200 in number, of which about 75 are used in the manufacture of rubber goods. The list is in compact form and handy for quick reference.

JUDICIAL DECISIONS.

HOOD RUBBER CO. VS. UNITED STATES RUBBER CO., AND OTHERS. Six of the defendants were manufacturers of lasts used in making rubber footwear, and were the only makers thereof in the United States. The United States Rubber Co., with the intent of restricting and controlling the interstate sale and transportation of lasts, made separate agreements with each of the last manufacturers whereby they agreed to sell no lasts for a certain fixed period, except to persons and corporations specified by it. By means of these agreements it deprived the plaintiff of the ability to procure lasts.

The court held that, where it did not appear that any of the last manufacturers intended to restrict and control trade, or knew of the contracts between the rubber company and other last manufacturers, there was no combination or conspiracy in restraint of the trade, and the last manufacturers were within their rights in making the contracts, and were not liable. But the court held that the action of the United States Rubber Co. was a domination of the trade and control, as used in the plaintiff's declaration, and was the substantial equivalent of monopoly as used in the statute.

Therefore, the court sustained the demurrers of all the defendants except the United States Rubber Co., whose demurrer was overruled. [The Federal Reporter, Vol. 229—page 583.]

PENNSYLVANIA RUBBER CO. VS. DREADNAUGHT TIRE & RUBBER CO. The court of trial held that the defendant was guilty of unfair competition in its markings and sale of certain tires known in the trade as "seconds," and entered a perpetual injunction enjoining such markings. The Dreadnaught Co. did not appeal from this part of the trial court's decision, but from another part concerning the sale of other tires in which the court of trial held "that, unless in connection with the sale and disposition of the defendant's 'seconds,' the bill cannot be sustained" and entered a decree "that in other respects the bill of complaint be and the same is hereby dismissed."

The Federal Circuit Court of Appeals, Third Circuit, held that, where a bill alleging unfair competition made no mention of any trade-marks of complainant, or the violation thereof, and it appeared that when complainant called defendant's attention to defendant's alleged violation of its rights, no mention was made of the use of any alleged trade-mark, the case would be treated as one of alleged unfair competition, though argued as though it involved a trade-mark.

That, where it did not appear that any intending purchaser of complainant's automobile tire had been misled, or could be misled, by the markings of the defendant's tire, into buying defendant's tire under the belief that he was getting complainant's, no case of unfair competition was established. The court below having fully and satisfactorily discussed the case, the Court of Appeals affirmed its decree, with the addition that the bill be dismissed without prejudice to complainant's right to renew the same, if any confusion of goods should thereafter develop in the course of trade. [The Federal Reporter, Vol. 229—page 560.]

RUBBER TRADE INQUIRIES.

THE inquiries that follow have already been answered; nevertheless, they are of interest, not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The editor is therefore glad to have those interested communicate with him.

[192.] Names and addresses of manufacturers of safety vulcanizers have been requested.

[193.] Inquiry has been received for the name of a maker of machines for cutting rubber sheets in small pieces, for making cement.

[194.] Concerns manufacturing machinery for the pulverizing of scrap rubber are sought.

[195.] A correspondent requests names of manufacturers of machinery used for making insulated wire.

[196.] Inquiry has been received for the addresses of tennis ball manufacturers.

[197.] The address of a dealer in M. R. hydrocarbon has been requested.

[198.] Another inquiry has been received during the month for names of manufacturers of sponge rubber.

[199.] A correspondent requests the name of the manufacturer of the "New Year" hot water bottle.

[200.] Information is sought regarding the process of manufacturing of hard rubberset shaving brushes.

[201.] A jobber of advertising novelties desires to add toy balloons to his line.

[202.] The address of a manufacturer of dipping machines is requested.

[203.] We are asked for the names of manufacturers of glass and porcelain dipping molds.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

A firm in Spain desires agency for that country for a first-class line of pneumatic tires. Report No. 74,192.

An agent of a large American steel company in Chile wishes to represent an American manufacturer of fire hose. An order can be placed immediately, it is stated, for from 5,000 to 8,000 meters of canvas fire hose (from 16,404.15 feet to 26,246.64 feet), a sample of which may be inspected at the Bureau or its district offices. As the demand for this hose is urgent, quotations are desired by cable, giving the price on board at Valparaiso per meter, the conditions of payment, and the approximate date of shipment. Report No. 21,702.

LATE CUSTOMS RULINGS.

The Harshaw, Fuller & Goodwin Co., Cleveland, Ohio, protested the collector's assessment of 15 per cent on bone black as a pigment. The importers claimed that the merchandise was used as a bleaching material in the manufacture of cream of tartar and tartaric acid, and that it was never used as a pigment. The customs examiner who passed the goods testified that a mistake had been made and the board sustained the claim for free entry under the provision in the law for bone black not suitable for use as a pigment. Reliquidation was ordered.

According to a recent decision of the United States Court of Customs Appeals, gutta jelutong, commonly known as Pontianak, is classified with spruce gum, and dutiable as a non-enumerated, unmanufactured article. The Treasury Department therefore has instructed that jelutong and other similar crude gums, not drugs, shall be classified at the rate of 10 per cent ad valorem on importations made 30 days from May 12, 1916.

THE OBITUARY RECORD.

A VETERAN RUBBER MANUFACTURER.

JAMES H. SEIBERLING, president of the India Rubber & Insulated Wire Co., Jonesboro, Indiana, died at his home July 7. He was born in Summit County, Ohio, November 25, 1835, and educated in the common schools of that county. He lived with his parents on the farm and assisted in the operation of a sawmill until 1860, at which time he formed a partnership with his brother, J. F. Seiberling, for the manufacture of farm implements and a general foundry business. A year later the brother's interests were taken over by S. H. Miller, and these two men continued their association in business up to the time of the death of Mr. Seiberling. In 1890 he went to Grant County, Indiana, taking an active interest in the oil and gas business then developing at that point, and was thus instrumental in the founding of Gas City, Indiana. In that year he also organized the Indiana Rubber & Insulated Wire Co., and became its president and general manager, retaining this office until the time of his death.

JAMES H. SEIBERLING.

Mr. Seiberling joined the Lutheran church at Doylestown, Ohio, at an early age, and remained to the end a consistent member. During his residence there he was superintendent of the Sunday school for 27 consecutive years.

He married Elizabeth Baughman in 1860, and to this union six children were born, of which A. F. and R. W. survive, both of whom are officers in the company.

Mr. Seiberling was an inventor of considerable note of rubber machinery, tires, etc.—and as a pioneer in the branch of the rubber industry with which he was affiliated, he formed a wide circle of prominent and influential friends who mourn his loss.

HEAD OF A RECLAIMING COMPANY.

John R. Trewin, president and treasurer of the Stockton Rubber Co., Stockton, New Jersey, died at Mercer Hospital, Trenton, on July 10, subsequent to an operation. Mr. Trewin was 48 years old. He was born in Flemington, New Jersey, and educated in the public schools there. He entered the employ of a clothing concern in Flemington and later became proprietor of a retail clothing establishment in Lambertville, New Jersey.

In 1905 he became associated with E. K. Price and O. A. Blackwell, forming the Stockton Rubber Co. Mr. Blackwell retired in 1907, when his stock was purchased by D. J. Price, vice-president of the company.

For the last five years Mr. Trewin made his residence in Trenton, New Jersey, where he was a member of Masonic bodies and the Elks. He is survived by a widow.

FREDERICK C. BREAKSPEAR.

Frederick C. Breakspear, general manager of the rubber factory of A. G. Spalding & Bros., at Chicopee Falls, Massachusetts, died recently in New York City. Mr. Breakspear was one of the veterans of the Spalding organization with a service record which began with the old Peck & Snyder firm in 1875. From his first position as errand boy, his progress was steadily forward, one promotion following another during his service with that concern, and continuing when the Peck & Snyder firm was acquired by A. G. Spalding & Bros. in 1890.

Mr. Breakspear was placed in charge of the Chicopee factory in 1894 and occupied that position to the time of his death. His life was a conspicuous example of what conscientious zeal, ability in one's line and singleness of purpose can accomplish—traits of character which, together with a pleasing personality, brought their rewards of confidence and lasting friendships.

Mr. Breakspear occupied a position of large influence in his home town. He was for many years a park commissioner of Chicopee Falls, and at his death was president of the Manufacturers' Association there.

BUILDER OF A LARGE BUSINESS.

George E. Austin, manager of the Imperial Rubber Co., New York City, died suddenly at his home in Brooklyn last Monday of heart failure.

Mr. Austin was born in London, England, 50 years ago, and received his education in that city. On graduating from the high school he entered the employ of the London Rubber Works. He came to this country in 1886, connecting himself with the Commonwealth Rubber Co., New York City, and two years later established the Imperial Rubber Co., developing an extensive foreign and domestic business in belting, hose and other mechanical goods. Later he added to his business a line of bicycles, conducting this as the Imperial Cycle Co. of New York City. In 1891, with George M. Ayres, he formed a partnership under the name of the Duplex Rubber Co., to deal in mill supplies and mechanical goods.

Mr. Austin was a man of wide acquaintance, ambitious and energetic, and the Imperial Rubber Co. is the practical result of his activity and business acumen. He leaves a widow and two married daughters.

A PIONEER IN THE BRITISH TIRE TRADE.

Charles Challiner, joint managing director of the Shrewsbury & Challiner Tire Co., Limited, died suddenly at his home, Manchester, England, on June 15. He was 67 years of age and a native of Tinsley, near Sheffield, where his early business life was devoted to the engineering trade. Later he moved to Manchester and engaged in the solid tire business in a small way, which rapidly grew under his able management. His business ability and inventive genius have made his name prominent in the development of the solid tire industry of Great Britain, among his inventions being the cup tire for carriages, and the cross-ribbed tires largely used on motor fire engines. He is survived by his brother, Walter Challiner, who is still connected with the Shrewsbury & Challiner Tire Co., Limited; his eldest son, C. S. Challiner, secretary of that company; and two other sons, J. A. Challiner and T. Challiner, also in the tire trade.

A PROMINENT JAPANESE EXPERT.

Yutaro Yoshida died on the 20th of May. He was superintendent and technical expert of the Toyo Rubber Co., Limited, which is one of the leading rubber manufacturing companies in Tokio, Japan.

The Electric Storage Battery Co., Nineteenth street and Allegheny avenue, Philadelphia, Pennsylvania, is having plans drawn by the William Steele & Sons Co., 1600 Arch street, Philadelphia, for the erection of a seven-story reinforced concrete and brick factory addition, 115 by 117 feet, at a cost reported to be about $300,000.

News of the American Rubber Trade.

NEW OFFICE BUILDING OF FISK RUBBER CO.

THE Fisk Rubber Co., Chicopee Falls, Massachusetts, has just moved into a fine, modern six-story office building of cut stone and brick. The building contains every modern device which makes for organization and efficiency. The whole basement of the building is used for a check room. On the ground floor, at the main entrance, is a spacious reception hall, at one side of which is an information bureau. This floor contains the purchasing, traffic and engineering departments. On the second floor are the service and architectural departments, and the advertising department, which also occupies a portion of the third floor. The third floor is occupied by the correspondence department and the mailing room, and here one large and well-furnished room is set apart exclusively for the use of the office boys. On this floor, also, is the telephone exchange and a private branch of the Western Union Telegraph Co., and the general manager's office and the stenographic department. The fourth floor is given over to the accounting department. The fifth floor contains the offices of the president and vice-president, as well as the statistical department. On the sixth floor are large conference rooms, the president's private dining-room, a cafeteria which will accommodate about 300 at one time, the private dining-room of the heads of departments, and a thoroughly equipped kitchen. Elevators run the full height of the building, and from the sixth floor to the basement, at the rear, is a specially constructed brick fire-escape tower which can be entered from each floor.

RESALE OF THE B & R RUBBER CO. PLANT.

At the auction sale of the B & R Rubber Co., North Brookfield, Massachusetts, on the 29th of June, the property was bid off to Thomas G. Richards, president of the company, for $228,000, the next highest bid being $227,000 by his former partner, Charles C. Beebe. This sale was made subject to the approval of the United States Court. When the matter came up before the judge on July 12, it was found that a bid of $233,000 had been offered since the auction, and the court therefore ordered that the sale be re-opened on July 19, at 11:30 A. M., at the office of the company, with the same auctioneer. This sale was advertised to be subject to an upset price of $265,000, on which the receivers reserved the right to waive if they deemed it advisable. The sale was held at the time appointed, and T. G. Richards was again the purchaser at $256,000 which, although $9,000 less than the advertised upset price, was approved by the court.

DU PONT INTERESTS PURCHASE FAIRFIELD RUBBER CO.

The Fairfield Co., one of the subsidiaries of E. I. duPont de Nemours & Co., has purchased the Fairfield Rubber Co., Fairfield, Connecticut, and will operate the concern on the same lines as heretofore. The Fairfield company manufactures a rubber carriage cloth, and employs about 100 men. The home office has been transferred to Wilmington, Delaware, but it is not thought that there will be any change of importance at the plant. It is said that the Fairfield company has large contracts in this country and abroad; in fact, these contracts are rumored to be large enough to keep the plant busy for a year. If expansion is determined upon there is plenty of room at the Connecticut plant, which has several acres of vacant ground adjoining.

E. W. Harrell, president of the company, who has been associated with it since 1880, has retired, and has been succeeded by R. R. M. Carpenter, president of the Fabrikoid Co. and one of the directors of the duPont corporation.

ANNUAL CONVENTION OF THE FAULTLESS RUBBER CO.

The annual convention of the Faultless Rubber Co. was held at Ashland, Ohio, from the 20th to the 22nd of July, inclusive. There were approximately 70 representatives of the company present and the period of meeting was divided between business and pleasure. The convention was opened by Sales Manager W. H. Balch, whose initial remarks took the form of thanks to those present for their effective coöperation during the year just passed. This was followed by a discussion of the advertising and selling campaign of the company by H. S. Lett, advertising manager of the Faultless Rubber Co., and M. P. Gould, of the M. P. Gould Co. of New York, who has general charge of Wearever advertising. In the evening a dinner and musicale were given by President T. W. Miller, at his beautiful residence, and Friday, the 21st, was devoted to a tour of the factory, conducted by President Miller and Superintendent C. E. Campbell. Subsequently Mr. Miller delivered an address outlining the policy for the coming year. This was followed by interesting remarks by Messrs. Balch and Gould. Saturday, the 22nd, was devoted to concluding business and the departure of delegates to their respective homes.

RUBBER COMPANY DIVIDENDS.

The United States Rubber Co. paid a quarterly dividend of 2 per cent on the first preferred stock and a quarterly dividend of 1½ per cent on the second preferred stock of the company, on July 31, to stockholders of record July 15.

The Kelly-Springfield Tire Co. has declared a quarterly dividend of 4 per cent on common stock, payable August 1, to stockholders of record July 17.

At a meeting of directors of the B. F. Goodrich Co., held July 26, a dividend of $1.75 per share on the preferred stock was declared, payable October 2, to stockholders of record September 21; also a quarterly dividend of $1.00 per share on the common stock, payable November 15 to stockholders of record November 3.

The New Jersey Zinc Co. has declared an extra dividend of 10 per cent, payable August 10 to stockholders of record August 1. The regular quarterly dividend of 4 per cent has been declared, payable August 10 to stockholders of record August 1.

RUBBER COMPANY SHARE QUOTATIONS.

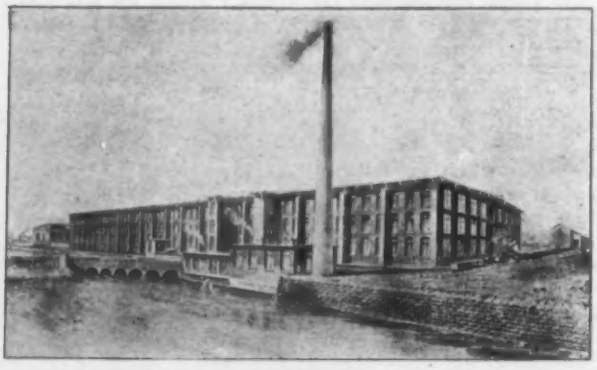
The following market quotations of shares of rubber manufacturing companies on July 25 are furnished by John Burnham & Co., 115 Broadway, New York City, and 41 South La Salle street, Chicago, Illinois:

	Bid.	Asked.
Ajax Rubber Co. (new)	64	65
Firestone Tire & Rubber Co., common	915	930
Firestone Tire & Rubber Co., preferred	111	115
The B. F. Goodrich Co., common	72	73½
The B. F. Goodrich Co., preferred	113¾	114
Goodyear Tire & Rubber Co., common	222	226
Goodyear Tire & Rubber Co., preferred	106	106¾
Kelly-Springfield Tire Co., common	71¾	72
Kelly-Springfield Tire Co., 1st preferred	96	97½
Miller Rubber Co., common	200	215
Miller Rubber Co., preferred	104	106
Portage Rubber Co., common	113	116
Portage Rubber Co., preferred	115	117
Swinehart Tire & Rubber Co.	85	87
United States Rubber Co., common	52½	52¾
United States Rubber Co., preferred	108¾	109

The National Rubber & Specialties Co., Cincinnati, Ohio, has increased its capital stock from $20,000 to $100,000. The officers of this company are as follows: C. L. Bonnifield, president; G. M. Allen, vice-president; G. W. Drach, secretary and treasurer, and J. E. Bancroft, general manager.

THE CONNECTICUT MILLS CO.'S NEW ACQUISITION.

The Nemasket Spinning Mill at Taunton, Massachusetts, lately acquired by the Connecticut Mills Co., Inc., Danielson, Connecticut, has been reorganized under the name of the Taunton Cotton Mills Co. The mill has 30,000 spindles and will give



about 6,000,000 pounds product, somewhat less than two-thirds of the consumption of yarn at the Danielson factory. This is independent of the 3,000,000 pounds product of fabric at the company's Canadian plant at Sherbrooke, Quebec, which contains its own spinning equipment.

DOUBLES BY GEOMETRIC PROGRESSION.

The Morse Chain Co., Ithaca, New York, manufacturer of the "Morse Rocker-Joint Power Transmission," used in many rubber mills, has increased its capital from $400,000 to $1,500,000, for the purpose of greatly enlarging its plant. The business was established in Trumansburg, New York, in 1904, and two years later removed to a new factory at Ithaca, double the size of its former one. Six years later the plant was enlarged to more than twice its former capacity, and present plans contemplate again doubling the size of the plant. The addition of a large storage building is nearly completed, and additions to the steel and wire mills, and a new gas producer building are well under way. The main building is to be increased to more than 900 feet in length, and when these additions are all completed, the company will have a total floor space of approximately seven acres.

CONVENTION OF THE CONTINENTAL SALES STAFF.

The third annual convention of the sales staff of the Continental Rubber Works, Erie, Pennsylvania, was held in Erie last month. The attendance embraced branch managers from New York, Chicago, and San Francisco agencies and factory representatives from Middle and Atlantic States and from the South and Southwest. The convention lasted a week, combining business and pleasure, including daily conferences, dinners, luncheons, motor rides, picnics and country club diversions. This company has, under the efficient direction of Theron Palmer, become one of the important rubber manufacturing organizations of the country.

KAUFMAN RUBBER CO., LIMITED.

The representatives of the Kaufman Rubber Co., Limited, Berlin, Ontario, Canada, during the week of June 19, held an important conference at the company's headquarters in that city. The branch managers came from all parts of Canada, and the object of the convention was to discuss business topics and to plan the campaign for the coming season. The entire plant was inspected under the direction of Manager A. R. Kaufman and Superintendent J. H. Roedding. There were business sessions for the discussion and interchange of business views, and between times, various entertainments, such as automobile rides, a clam-bake, and a banquet at one of the principal hotels, at which several interesting addresses were given. A handsome bear rug was presented to Manager A. R. Kaufman, and a set of leather-upholstered living-room furniture to Sales Manager W. E. Wing. The business of the company was reported as excellent and the output this year will be larger than ever before.

TRADE NOTES.

The Willard Storage Battery Co., 274-276 East One Hundred and Thirty-first street, Cleveland, Ohio, will erect four new buildings in addition to its present plant. These buildings will cover 150,000 square feet, and when completed will double the present floor space. The new power house and plant will be modeled along the lines of the best engineering practice and 40,000 amperes at 110 volts will be generated.

Joseph Chalfin, well-known dealer and importer of scrap rubber, has removed his offices from 36-38 Whitehall street, New York City, to 42-44 Whitehall street, where he occupies larger quarters, equipped with every convenience.

A newly organized rubber concern is the Scioto Rubber Co., located at 5th avenue and the Big Four tracks, Columbus, Ohio. The plant is well equipped for the manufacture of clothing, toy balloons, and hospital sheeting. The officers are C. M. Linthicum, managing director; Guy C. Bowman, president; C. F. Johnson, vice-president, and C. L. Lamont, secretary.

The Lycoming Rubber Co. (U. S. Rubber Co. factory), Williamsport, Pennsylvania, recently inaugurated a graduated bonus system for the encouragement of apprentices while learning the making of rubber footwear. The schedule in force shows that the first week apprentices will receive 75 cents per day. After that they will receive piece-work pay and a bonus graduated down from $2.00 the second week to 50 cents the eighth week, after which straight piece work rate will be paid. Any girl whose entire ticket is transferred from tennis to gum shoes will receive similar graded bonuses for the first seven weeks.

T. J. Jones, for twenty years with the Mechanical Rubber Co., Cleveland, Ohio, where he was manager of the belting and hose department, and for the past three years assistant general manager of the Ohio Rubber Co., of that city, has recently incorporated the latter concern, which deals in mechanical goods, canvas belting and tires.

In THE INDIA RUBBER WORLD of June 1, 1916, a note appeared to the effect that we understood that W. M. Mackintosh contemplated starting a factory in the neighborhood of Montreal for the purpose of treating fabrics with "Galbulose," of which he is the inventor. Mr. Mackintosh writes that the information we received was somewhat premature. The use of this process and material is already established in Canada with two concerns, and is showing satisfactory results, and Mr. Mackintosh predicts a great future before it in several directions. At present the inventor is not promoting a company, his time being practically monopolized as a specialist in a munition factory.

GOODYEAR TIRE & RUBBER CO. PROMOTIONS.

M. D. Montgomery, who has been acting as manager of the Denver, Colorado, district for the Goodyear company during the illness of the late S. E. Gillard, has been appointed to the managership.

F. C. Moyer, formerly in charge of the Des Moines, Iowa, branch, is now branch manager at Minneapolis, Minnesota, succeeding G. H. Barmore, who has been made manager at the Milwaukee, Wisconsin, branch. The position of manager at Des Moines has been filled by F. W. Telford, formerly supervisor of motor truck tire sales in Chicago, Illinois.

The branch managership at El Paso, Texas, left vacant by the death of G. F. Dennis, has been placed in the hands of T. J. Fitzgerald.

VERNON ROYLE.

THIRTY-FIVE years ago the first Royle tubing machine was put into service. At that time the name Royle was unknown to rubber manufacturers. Today it is no exaggeration to say it is a household word throughout the trade.

Although not the original inventor of the process of making rubber tubing and allied forms, by forcing a plastic mass through a die, the development of the tubing machine has been so largely the personal work of Vernon Royle, the subject of this sketch, that he may be justly termed the father of this method of producing formed rubber products.

VERNON ROYLE.

Born in Paterson, New Jersey, on June 9, 1846, Vernon Royle received such education as the local schools of the time afforded, supplementing this by individual study and work, largely along mechanical lines. His first real experience of the elements of machine design and construction began with his apprenticeship to the pattern-making trade, which he mastered thoroughly in his father's shop and elsewhere, and later, through his connection with the old firm of Vanderburg, Wells & Co., makers of printers' furniture, wood type, etc., in New York, in ante-bellum days. Here young Royle's aptitude for mechanics led to his being placed in charged of the routing department, where he became familiar with the merits and defects of the routing machine, a fact that was not without a deterimning influence on his future career, as it was his intimate knowledge of routing machines, that in later life enabled him to develop the router that has made the name of Royle famous and which proved the foundation of the Royle success.

Illness terminated Mr. Royle's career with Vanderburg, Wells & Co., and there followed a year of battle for health; then seven years as secretary of the Board of Education of Paterson, followed by two years as Commissioner of Education. In 1880 he embarked on what proved his life work by forming a partnership with his father, John Royle, Sr., and his brother, John, Jr., for the prosecution of the machine business under the name of John Royle & Sons, under which name the concern has existed uninterruptedly to the present time.

The first Royle tubing machine was produced in 1881. This followed roughly the lines of a crude experimental machine already in existence, but was the first attempt to build a rubber machine with some pretensions to mechanical excellence. Judged by the machines of today, it was crude enough, yet it marks a distinct advance and was eagerly accepted by rubber manufacturers as the most efficient machine of its type in existence. It was, in short, the first tubing machine of real practical value.

It would extend this brief review unduly to mark the various steps by which the Royle tubing machine, as it is today, was developed. Detail after detail was made the subject of special study with a view to increasing the range of the machine and its productive capacity, all being finally brought together in the perfected tubing machine as now made, a machine with a productive capacity at least six times as great as the earlier machines, while its range has been extended to include sizes and classes of goods formerly deemed entirely outside the range of the tubing machine. Continuous-length garden hose, for instance, is an example of the adaptation of the machine to meet a new demand, while many auxiliary devices for use in connection with tubing machines were invented, including strainer heads for reclaiming rubber, three-way heads for the same purpose; special insulating heads for making rubber packing; compound screws and dies for marbleized tubing, etc.; also a very important machine, the circular loom for weaving seamless fabric coverings for steam, fire and garden hose. This machine was first placed on the market as the Royle-de Laski loom, from which has grown the present Royle circular loom, a type involving many important modifications of the original model. Two sizes are made, one for garden hose, the other for coverings up to eight inches in diameter.

Parallel with the development of the tubing machine proceeded the development of the insulating machine, a machine broadly similar to the tubing machine, but so modified as to permit of the application of seamless insulating coverings to wires and cables. Prior to the introduction of this machine, insulating compounds were commonly applied in strips by strip-covering machines, the raw edges of the strips being supposed to unite under pressure in the machine. The method answered well enough, but was essentially defective as the seam was a source of weakness. The Royle insulating machine corrected this, as it applied the covering in an absolutely seamless, homogeneous form, and hence proved a revolutionary machine in its field.

This, in brief outline, has been Vernon Royle's contribution to the rubber industry—the work of a lifetime summarized in a few words, yet so numerous have been Mr. Royle's inventions in this field, that 17 patents, embracing over 196 claims, have been granted him for his purely original work.

Nor has the rubber trade been the sole field of Mr. Royle's activities. Since 1880 he has been a dominant figure in the mechanical branches of photo-engraving, and in jacquard card cutting for silk weaving, in both of which lines, his inventions have been accepted as representing the highest achievements in efficiency. From a purely mechanical and technical standpoint, these lines are more interesting than the rubber line, involving, as they do, machinery of the most delicate and accurate construction, both in design and workmanship. In both lines, Royle machines are widely popular, the photo-engraving machinery, in particular, being used in every civilized country in the world and some rather uncivilized ones as well. In the case of tubing and insulating machines, 73 patents in all have been issued to him covering 671 claims.

At 70 years of age Mr. Royle is as active as ever in the conduct of his business and is still devising new things. His latest work includes improved motor-driven, positive-action take-offs for tubing and insulating machines, and he is now designing a tubing machine that will take dies up to 6 inches in diameter.

In addition to his activities in the field of mechanics, Mr. Royle has always taken a broad interest in the civic affairs of his native city, having served as a Commissioner of Education and as an officer of the Taxpayers' Association, serving on the committee charged with solving the difficult problem of sewage disposal in the Passaic Valley. At the present time, he is a director of the Hamilton Trust Co., a leading financial institution of Paterson, and of the Cedar Lawn Cemetery Co., to both of which he devotes considerable time. He is also a member of the American Society of Mechanical Engineers; the Masonic fraternity; the Hamilton Club and the New Jersey Historical Society. Mr. Royle is of Scotch-English descent and was married in 1872, his wife dying in 1908. He has two sons, Heber and Vernon E., both of whom are associated with him in business.

NEW INCORPORATIONS.

Alpha Rubber Manufacturing Corporation, June 30 (Delaware), $1,000,000. Joseph A. Berger, L. Edward Dean, John F. Rau—all of Chicago, Ill. Principal office, 8 S. Dearborn street, Chicago, Ill. To manufacture rubber tires, tubes and all other rubber goods and material used in same.

Armored Tire Co., July 3 (Maine), $100,000. Ernest L. McLean, Augusta, and E. M. Leavitt, Winthrop—both in Maine. To manufacture and sell automobile tires and reliners for automobile tires and pneumatic tires and reliners of any and all descriptions.

Atlantic Rubber Manufacturing Co., Inc., July 7 (New York), $15,000. William Schrader and William Ehlers, of 337 Broadway, New York City, and Felix Schwemer, 402 First avenue, College Point, L. I.

Buckeye Tire Co., The, May 24 (Ohio), $5,000. R. S. Graves, R. H. Woolley, C. W. Shields, John Bleska, and S. W. Lewis.

Burrill Tire Co., The, May 9 (Massachusetts), $200,000. Frank H. Burrill, Charles Noll, Edward F. Loughlin—all of Concord Junction, Massachusetts. Principal office, Concord, Massachusetts. For the purpose of manufacturing and selling at wholesale and retail a certain patented device known as the Burrill Tire Tool for removing rims from automobile tires.

Colonial Braid Co., Inc., June 12 (New York), $10,000. Robert F. Dreuge, 1120 Fox street; Sylvia Kaipf, 564 West 149th street—both in Bronx, and C. Agnes Berard, 541 16th street, Brooklyn—all in New York City. To manufacture elastic braid, etc.

Chicago Tire Co. of America, Inc., July 20 (New York), $100,000. S. Bernheim, 35 Nassau street, New York City; C. A. Weldon, 591 Seventh avenue, and Harry J. Jacobson, 555 Grand street—both in Brooklyn, N. Y.

Corcoran Tire & Rubber Co., May 18 (Ohio), $5,000. Thomas J. Corcoran, Jacob A. Hollander, Charles E. Weber, Phil W. Tozzer, and T. M. Miller.

Dorman-McClelland Tire & Supplies Co., July 5 (Iowa), $10,000. F. E. Dorman (president); Tom McClelland (vice-president); Robert McClelland (secretary and treasurer), all of Davenport, Iowa. Principal office, Davenport, Iowa. To sell and repair tires and other auto accessories.

Duplex Tread Tire Co., June 13 (Indiana), $10,000. Edward C. and Lucile Meisner, and Samuel G. Boyer. Principal office, Terre Haute, Indiana. To manufacture auto tires.

Eagle Rubber Co., The, June 1 (Ohio), $50,000. H. R. Gill, Harry V. Pohle, J. E. Arnold, J. W. Dash and Clyde C. Sherick. Principal office, Ashland, Ohio. To manufacture toy balloons, rubber novelties, sundries, etc.

Fibre Web Co., April 27 (Indiana), $15,000. W. E. and L. W. Bundy, and D. H. Snepp. Principal office at Kewanna, Indiana. To manufacture fiber board.

Kansas City Tire & Accessory Co., April 14 (Missouri). Glenn R. Donaldson (president), B. B. Weldon (vice-president), and Tom C. Shroeder (secretary and treasurer). Principal office, 1518 Grand avenue, Kansas City, Missouri. To deal in tires and automobile accessories.

Keystone Metallic Tire Co., May 18 (Delaware), $100,000. Franklin L. Mettler, Walter R. Mull, Alfred Whartenby—all of Wilmington, Delaware. Principal office, 702 Market street, Wilmington, Delaware. To manufacture and sell insulated and non-insulated metallic ties for steel, electric and other railways.

Lee Tire Co., June 27 (Tennessee), $5,000. G. M. Seewald, F. R. Rouse, R. F. Seewald, J. M. McKernan and Earl King. Principal office, Memphis, Tennessee.

Non-Skid Co. of America, June 7 (Massachusetts), $200,000. Robert M. Clark, Newton Centre; Albert H. Harrington, Fall River; E. Clifford Potter, 50 Congress street, Boston—all in Massachusetts. Principal office, Boston, Massachusetts. To manufacture and deal in motor vehicles, parts, accessories, tools and appliances, and apparatus and machinery for making the same.

Overtire Service Co., Inc., June 16 (New York), $1,000. Philip Rosenberg, 121 Hopkins street; Isaac Slutzky, 344 Jay street, and Abraham Kempner, 2021 Cropsey avenue—all in Brooklyn, N. Y. Principal office, Brooklyn, N. Y. To manufacture and deal in all kinds of tires.

Pan-American Rubber Co., June 29 (Wisconsin), $200,000. F. J. Ramler, H. C. Clausen and N. J. Kopmeier. Principal office, Milwaukee, Wisconsin. To manufacture and deal in rubber goods.

Standard Album Corporation, March 21 (New York), $10,000. Jennie H. Betts and Julia E. Byxzee, 410 Riverside Drive, New York City. To deal in pictures, leather, rubber goods, etc.

Stein, A. S., Inc., July 10 (New York), $500. Arthur S. Stein, Jersey City, N. J.; George J. Constable, 354 Ocean avenue, and Henri Pressprich, 256 79th street—both in Brooklyn, N. Y. To deal in auto tires and tubes.

Tempest Waterproofing Corporation, June 15 (New York), $10,000. W. Tempest, 234 Central avenue, West Hoboken, N. J. Charles C. Turner, 67 West 104th street, and Herbert Tempest, 71 East 11th street—both in New York City. Principal office, New York City. Waterproofing fabrics.

Thomas & Guzman Co., Inc., July 19 (New York), $10,000. William W. Thomas, Octavia J. Thomas, A. M. Lazarowitz—all of 51 Leonard street, New York City. To deal in tires of all kinds.

Tire Co. of Baltimore, Inc., July 10 (New York), $100,000. Sydney Bernheim, 305 West 72nd street, New York City; Catherine A. Weldon, 591 Seventh street, and Harry H. Jacobson, 555 Grand street—both in Brooklyn, N. Y.

Triangle Packing Co., The, March 17 (New York), $100,000. Edward H. Letchworth, Fritz Fernow, Walter M. Wilkins, 12 Cleveland Place, Buffalo, New York. To manufacture packing.

Twin Tube & Rubber Co., June 26 (Delaware), $1,000,000. George W. Dillman, F. D. Buck, M. L. Horty—all of Wilmington, Delaware. Principal office, Delaware Charter Guarantee & Trust Co., 328 DuPont Building, Wilmington, Delaware. To manufacture and deal in inner tubes, solid or pneumatic tires, rubber shoes, rubber heels, etc.

Washington Tire & Rubber Co., May 16 (Delaware), $250,000. E. P. Altenberg, East Palestine; F. H. Grove, Columbiana; G. P. Wilson, Steubenville—all in Ohio. Principal office, United States Corporation Co., 311 South State street, Dover, Delaware. To manufacture and deal in rubber tires and tubes.

CANADIAN CONSOLIDATED PICNIC HUGE SUCCESS.

The natal day in Canada, July 1, is celebrated annually as "Dominion Day," and on this occasion the annual picnic of the employes of the factories of the Canadian Consolidated Rubber Co., Limited, and the Canadian Consolidated Felt Co. was held at West Side Park, Waterloo, Ontario.

Over 5,000 people were in attendance and the all-day program of sports was highly enjoyed. Valuable prizes were given for the different events, which included amusing features such as frog and wheelbarrow races, pie eating and watermelon contests, and a Mutt and Jeff race.

A tug-of-war inter-company contest between the Kimmel felt factory and the Berlin felt factory against the Merchants Rubber Co. and the Dominion tire factory resulted in victory for the Dominion tire team; while in the relay inter-company race the Merchants Rubber team conquered.

Refreshments were served in abundance, and two excellent bands provided music.

TRADE NOTES.

Charles E. Miller, Anderson, Indiana, has just completed a new brick addition to accommodate the increased demand of the rubber department. This structure adds about 3,500 square feet of floor space to the factory. A second addition is in early prospect.

It is said that the McGraw Tire & Rubber Co. will erect a warehouse at 135 Mt. Royal avenue, Baltimore, Maryland.

The Lee Tire & Rubber Co., Spring Hill, Pennsylvania, has resumed operation after the annual Fourth of July and stock-taking suspension.

Thomas Midgley has petitioned to enjoin the Lancaster Tire & Rubber Co. from using the word "Midgley" in connection with its products, his contention being that the Lancaster company has not lived up to an agreement made at the time he severed relations with the company, that at the expiration of three months, the use of his name in connection with its tires would be discontinued.

More than 1,000 employes of the McGraw Tire & Rubber Co., East Palestine, Ohio, have formed the McGraw Rubber. Club, a social organization. To keep in touch with the activities of the club, a bright little four-page paper, entitled "The Rubber Leaf," is to be published, bi-monthly. Lewis E. Stein is the editor.

The Fisk Rubber Co., Chicopee Falls, Massachusetts, has equipped all the new Indian motorcycles of the machine gun company of the Second Regiment, M. V. M., bound for the Mexican border, with "Red Top" motorcycle tires, free of charge. The labor troubles which have kept the tire makers away for three weeks have been finally settled, and they are now back at work.

The Continental Rubber Co., Sandusky, Ohio, is erecting a two-story building, 50 by 200 feet, on West Monroe street. It is expected that the plant will be ready for operation by November 1, with a capacity of 200 tires a day. H. H. Herman, formerly with the Firestone Tire & Rubber Co., will be superintendent.

The Hester Tire & Rubber Co. has obtained a site at Lima, Ohio, upon which a main factory building, 60 by 150 feet, and a power house, 60 feet square, are to be erected. The company officials state that work on the buildings will soon be started, and machinery will be installed before early fall. The capacity of the plant will be 100 tires per day and 100 men will be employed. A second building for the manufacture of motor truck tires is also contemplated.

The B. F. Goodrich Co., Akron, Ohio, has opened a pneumatic tire service station at Yosemite National Park, Yosemite, California. This store will be under the jurisdiction of the San Francisco branch and will be in charge of S. M. Wynne.

The Blow Tire Sealer Co., at 21st and Race streets, Philadelphia, Pennsylvania, is putting a new tire sealer on the market.

The Kelly quick detachable wire wheel is now to be manufactured and aggressively marketed by the Craftsmen Motor Corporation, Chicago, Illinois.

The Bates Puncture Plugger, a plastic preparation for use in tires, is said to be a most effective resistant to punctures, and occupies but 5 per cent of air space. It is the invention of Edgar L. Bates, a western chemist, and controlled by Paul Richey of the Russell M. Seeds Co., Indianapolis, Indiana.

The Pan-American Rubber Co., Milwaukee, Wisconsin, notice of whose incorporation appears elsewhere in this issue, takes over the business of the Sporub Tire Co., which has been manufacturing inner tubes for about ten months. Factory quarters have been leased in the Kopmeier building, and a large production is planned. F. J. Ramler is president and general manager of the new company. Mr. Ramler is half owner of the Standard Racine Rubber Co., Milwaukee, and a large stockholder in the Racine Rubber Co., Racine, Wisconsin, having been engaged in the rubber and tire business for more than 16 years.

The Chicago, Illinois, branch of the Fisk Rubber Co. has been removed from 1440 Michigan avenue to new quarters at 2508 Michigan avenue, with a service station at 53-59 East Twenty-fifth street. The new office is complete and up-to-date in every detail, the building being two stories high, with basement, and having a 40-foot frontage and 190-foot depth. Wayne Murray, for five years in charge of this company's business in Texas, is manager.

CHANGES AT GOODRICH DEPOTS.

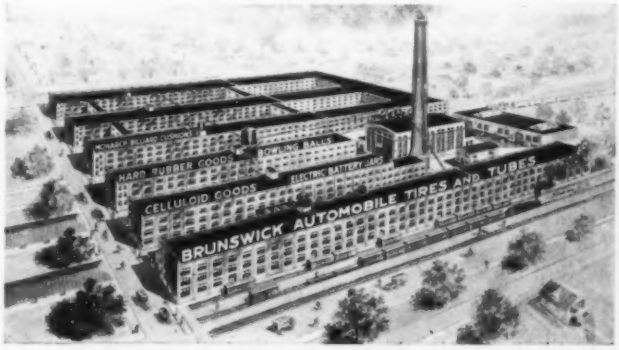
The B. F. Goodrich Co., Akron, Ohio, has recently re-opened its depot at Sacramento, California, located at 1129 Ninth street. George M. Gay has been appointed local manager.

The temporary store of the Goodrich company at Columbus, New Mexico, which has been operated as part of the depot at El Paso, Texas, is now maintained as a separate service station, Charles R. Serfass continuing in charge. The principal activity of this depot will be caring for government business incident to the military activity on the Mexican border.

THE BRUNSWICK COMPANY WILL MAKE TIRES.

The Brunswick-Balke-Collender Co., Chicago, Illinois, has greatly increased its rubber factory capacity and will enter the automobile field with a complete line of automobile rubber parts and accessories, from tires to the smallest rubber unit found on a car.

The accompanying illustration shows the newly erected addition to this company's factory at Muskegon, Michigan, where



the Brunswick Skid-Not tire and a new puncture self-healing tube are manufactured.

J. E. Duffield, formerly Western manager for the Thermoid Rubber Co. and more recently connected with the United States Rubber Co. interests, will be sales manager for the entire rubber goods and automobile accessories division.

TRUCKS MUST BE RUBBER-TIRED IN MONTREAL.

Complaining of the deterioration in the city's streets caused by truck wheels, Montreal, Canada, has passed a law compelling truck owners to provide the wheels of their vehicles with tires made of rubber, or of some other resilient material that will not injure the surface of the streets.

PERSONAL MENTION.

Samuel Norris, secretary of the United States Rubber Co., recently underwent an operation, from which attending physicians state recovery is a practically assured fact.

Edgar B. Davis, in charge of the Sumatra plantations of the United States Rubber Co., and H. Stuart Hotchkiss, vice-president of the General Rubber Co., recently left New York for the Sumatra district on a tour of inspection of the properties which, it is estimated, will consume about six weeks. They expect to return to New York early in November.

Arthur W. Stedman, manager of the crude rubber department of the Hagemeyer Trading Co., New York City, returned from an important and successful trip to England on July 20.

Grant Lambright, formerly superintendent of the Bucyrus Rubber Co., has recently assumed the management of the Marion Rubber Co. He is succeeded by John Field, formerly assistant superintendent of the Bucyrus plant.

D. P. Harris, head of the Harwaco Rubber Works, New York City, and of the D. P. Harris Hardware Co., returned from a trip to the Pacific Coast recently, and superintended the removal of these two concerns to their new building, corner of Church and Chambers streets.

William H. Wellington, of the commission house of Wellington, Sears & Co., has been elected a director of the Hamilton Woolen Co., to fill the vacancy caused by the death of Charles B. Gookin.

Maurice Horowich, of the Double Tread Tire Co., Binghamton, New York, has secured the agency of the Northland Rubber Co., of Buffalo, and will distribute Northland tires in Binghamton and vicinity.

B. C. Swinehart, for three and a half years manager of the Philadelphia branch of the Republic Rubber Co., has been called to the factory at Youngstown, Ohio, where he will have charge of the solid tire department. He is succeeded by H. S. Worthington, who has been connected with the Philadelphia branch for the past five years as assistant manager.

R. W. Pharis recently resigned as director and manager of the Columbus branch of the Pharis Tire and Rubber Co., Newark, Ohio, to assume the management of the International Tire Co., a distributing concern handling factory seconds, located at 187 Gay street, Columbus, Ohio.

E. P. Logan, formerly district manager of the St. Louis branch of the Federal Rubber Co., has recently assumed charge of the central district, with headquarters in Chicago, Illinois.

Edward C. Strayer, who has been the office credit man for the McGraw Tire & Rubber Co., East Palestine, Ohio, for the past two years, left for St. Louis, Missouri, during the past month, to take charge of the McGraw office there.

Fred H. Ayers, formerly New England district manager and for 13 years connected with the Fisk Rubber Co., Chicopee Falls, Massachusetts, has been appointed supervisor of districts, with charge of the entire outside organization of the company.

A. J. Pennington, formerly with the Dryden Rubber Co., Chicago, has been appointed general superintendent of the tire, tube and automobile accessories plant of the Brunswick-Balke-Collender Co., at Muskegon, Michigan.

J. L. Wacksmuth has been appointed local manager of the Washington depot of The B. F. Goodrich Co., Akron, Ohio.

B. F. Hochschild has resigned the office of treasurer and general manager of the Gordon Tire & Rubber Co., Canton, Ohio, and will announce later his new connection.

G. J. Bates, for the past ten years prominently identified with the tire business, has relinquished a prominent position with the Firestone Tire & Rubber Co. to accept the newly-created office of commercial manager of the King Motor Car Co., Detroit, Michigan.

G. F. Farasey, formerly with the Boston and Cleveland branches of the Kelly-Springfield Tire Co., has been made office manager of the local branch at St. Louis, Missouri.

I. B. Rohrer has been appointed general manager of the Fisk Rubber Co. branch at Council Bluffs, Iowa.

H. B. McMaster, general manager of branches of the Berger Manufacturing Co., Canton, Ohio, has resigned to become vice-president and general manager of the Gordon Tire & Rubber Co., of the same city.

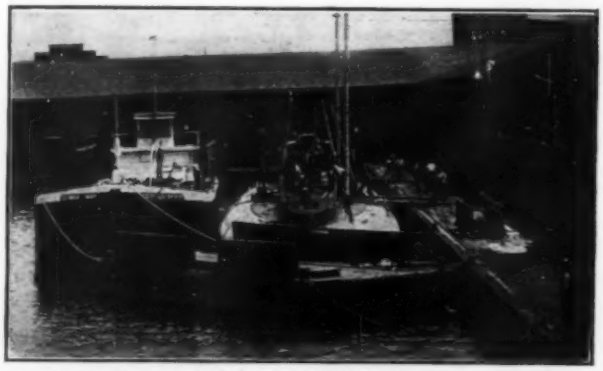
PREPAREDNESS PARADE AT MILWAUKEE.

Preparedness parades are in order all over the country, and in Milwaukee, Wisconsin, on July 15, the rubber trade was well represented in an enthusiastic gathering undaunted by the rainy weather. The Federal Rubber Co. representatives numbered 583, and each man and girl wore a white felt hat with a ribbon band on which the words, "Federal Rubber Co." were printed. The Cutler-Hammer Manufacturing Co., whose devices are so largely used in rubber factories, had 1,074 representatives in the parade. The following companies having branch stores in Milwaukee were also represented: Fisk Rubber Co., United States Rubber Co., Goodyear Tire & Rubber Co. The Wisconsin State Rubber Co. also had a file of representatives in the parade.

THE GERMAN SUBMARINE AND THE BRITISH BLACKLIST.

AN event of interest in the rubber trade, last month, was the arrival at Baltimore of the German submarine "Deutschland," and the taking on of a cargo to carry back to Germany. Great secrecy was maintained as to the character of this cargo, but that it comprises, in part, approximately 150 tons of Upriver fine rubber is a practical certainty.

It is considered quite probable that in the sale and shipment of this rubber some American rubber brokers and dealers were concerned. Soon after the arrival of the "Deutschland," and the



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Loading Rubber on the "Deutschland" at Baltimore.

reports of its intention to carry to Germany contraband materials, came the announcement by the British Government that over 80 firms, corporations or individuals in the United States had been placed on the "black list" under the "trading with the enemy act" which prohibits persons domiciled in the United Kingdom from dealing with these parties. Among these 80 houses are several connected with the crude rubber business and some of these feel that their business will be severely restricted if they cannot purchase rubber in any British home or colonial market, or secure transportation of goods from any port in British vessels.

RUBBER SCRAP DEALERS' PACKING STANDARD.

ACCEDING to a request, we publish in a slightly condensed form "Circular B" of the Rubber Scrap Division of the National Association of Waste Material Dealers.

All goods bought and sold under these specifiactions are understood to consist only of domestic manufacture unless otherwise stipulated. All rubber scrap bought and paid for net weight, no allowance for bagging nor covering of any kind, nor shall same be returned to seller.

DELIVERY.

A. Delivery of more or less on the specified quantity up to 2½ per cent is permissible.

B. If the term "about" is used, it is understood that 5 per cent more or less of the quantity may be delivered.

C. In the event that buyer should claim the goods delivered on a contract are not up to the proper standard, and the seller claims that they are a proper delivery, the dispute shall be referred to the Arbitration Committee of the National Association of Waste Material Dealers to be appointed for that purpose.

D. A contract for a carload, unless otherwise agreed upon, shall mean the minimum quantity recognized by the official classification tariff of the district in which the seller is located.

E. A ton shall be understood to be 2,000 pounds unless otherwise specified.

The standard of packing is given below:

1. RUBBER BOOTS AND SHOES must be packed as per Rubber Reclaimer's Circular No. 5. (Circular No. 5 is the same as No. 3 excepting that red, white, tan and fancy colored shoes must be kept out.)

2. TRIMMED ARCTICS must be closely trimmed and free of leather, tennis soles, tennis shoes and detached heels.

3. TRIMMED TENNIS SHOES must be black; closely trimmed; free of molded soles, and leather.

4. STANDARD AUTO TIRES must be free of the following: All McGraw tires such as "Imperial," "Pullman" and "Congress" and other tires of similar quality; all unguaranteed tires; heavy beaded tires; "Dayton Airless" and other filled tires, must not contain any hard, oxidized, burnt, single tube, motorcycle, stripped or badly worn tires nor tires containing leather or metal.

5. UNGUARANTEED TIRES must be free of heavy beaded tires, hard or oxidized, stripped, badly worn tires with leather and metal.

6. HEAVY BEADED TIRES must be free of hard or oxidized tires, stripped, badly worn and tires with leather and metal.

7. STRIPPED AND BADLY WORN TIRES must be free of hard or oxidized tires, heavy beaded and tires with leather and iron. A reasonable proportion of the tread must be on the tires.

8. NO. 1 AUTO TIRE PEELINGS must be free of cloth, metal and leather.

9. NO. 2 AUTO TIRE PEELINGS must consist of peelings from auto tire treads only and must be free of metal, leather and stripped auto tire fabric.

10. BICYCLE TIRES must be free of hard or oxidized tires, wire and beaded tires.

11. SOLID WAGON AND CAB TIRES must be free of metal and baby carriage tires.

12. SOLID MOTOR TRUCK TIRES must be free of metal and tires with hard bases and fiber bases.

13. AIRBRAKE HOSE must be free of metal, hard or oxidized hose and steam hose.

14. GARDEN HOSE must be free of metal, rags, rope and cotton covered hose.

15. LARGE HOSE must be free of metal, rags, rope, hard or oxidized hose and all cotton covered hose.

16. COTTON COVERED FIRE HOSE must be rubber lined, and free of hard or oxidized hose and metal.

17. NO 1 AUTO INNER TUBES must be strictly elastic floating tubes, free of crusty tubes, cloth and metal.

18. NO. 2 AUTO INNER TUBES KNOWN AS COMPOUNDED TUBES must be standard tubes, free of crusty tubes, cloth and metal.

19. NO 1 BICYCLE INNER TUBES must be strictly elastic floating tubes, free of crusty tubes, cloth and metal.

20. NO. 2 BICYCLE INNER TUBES KNOWN AS COMPOUNDED INNER TUBES must be standard tubes, free of crusty tubes, cloth and metal.

21. RED AUTO INNER TUBES must be standard tubes, not perforated, free of crusty tubes, cloth, metal and black patches.

22. NO. 1 WHITE RUBBER must consist of strictly clean white soft druggists' sundries and must be free of cloth and metal.

23. NO. 2 WHITE RUBBER must consist of white horse shoe pads, white toys, white mechanical goods, and to be free of cloth, metal, crusty, hard oxidized material.

24. NO. 3 WHITE RUBBER must consist of painted white rubber balls or toys and white jar rings, and to be free of cloth, painted wainscoating, metal and hard or oxidized rubber.

25. WHITE WRINGER RUBBER must be strictly white soft rubber, free of yellow wringer rubber, hard or oxidized wringer rubber, cloth and metal.

26. YELLOW WRINGER RUBBER must be free of cloth, metal and free of hard rubber.

27. MIXED BLACK RUBBER must be free of cloth, metal, crusty, hard or oxidized material, packing, stripped matting and tiling.

28. MATTING AND PACKING must be free of Garlock and piston packing, belting and similar material, metal and hard or oxidized stock.

29. NO. 1 RED RUBBER must consist of soft red druggists' sundries, free of maroon, chocolate, and other dark shades, also free of cloth and metal.

30. NO. 2 RED RUBBER must consist of material such as red toys, balls, mechanical red. Must be free of jar rings, soles, packing, hard or oxidized rubber cloth and metal.

31. RED PACKING must be free of hard or oxidized rubber, cloth and metal and discolored rubber.

This standard of packing was adopted by the Rubber Scrap Division and approved by the executive committee of the association on March 14, 1916, to be effective from April 1, 1916.

CHEMICAL INDUSTRIES EXHIBITION.

The second National Exposition of Chemical Industries will be held at Grand Central Palace, New York City, September 25-30, 1916. Many important manufacturing companies doing business with the industries wherein chemistry plays a part, will make exhibits. Several chemical and engineering societies will hold their annual meetings in that city during the week. The American Chemical Society, and the American Electrochemical Society are among the number.

The Bureau of Commercial Economics at Washington is cooperating with the exposition by arranging an elaborate program of motion pictures covering subjects dealing with the industries depending on chemistry. Many of these films will have their premier showing at the exposition. They will take the visitor through industrial plants, shops, manufactories, mines, etc., where visitors themselves are never admitted. They will show operations which in ordinary light would never be seen. They will demonstrate more than any other kind of motion pictures the great strides and improvement in the art of photography.

A few of the films that appear on the tentative program are: the rubber industry, the match industry, manufacture of explosives, varnish manufacture, silver mining, mining and manufacturing of iron, making of blotting paper, accident and fire prevention, manufacture and use of fertilizers and the manufacture of steel.

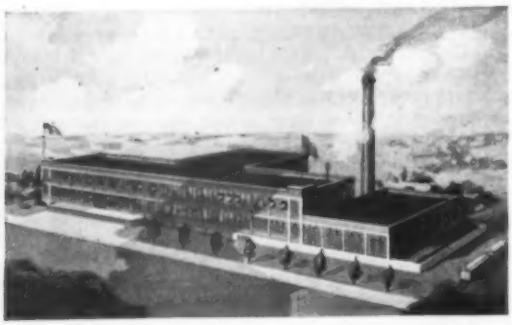
Some of these films are now being made, and other features are in active preparation for the exposition.

THE RUBBER TRADE IN AKRON.

By Our Regular Correspondent.

THE Mason Tire & Rubber Co., at Kent, Ohio, is completing installation of equipment in its new factory and expects to start making tires within a few days. The plant is of steel and concrete construction, is 220 feet long and contains about 40,000 square feet of floor space, having a capacity of 500 tires and tubes per day. This structure stands in the middle of a 16-acre tract of land, thus affording ample room for expansion.

The officers of the company are: O. M. Mason, president; I. R. Davies, secretary; D. M. Mason, general manager, and A. S. Hetzel, sales manager. B. E. Frantz, superintendent, has



PLANT OF THE MASON TIRE & RUBBER CO., KENT, OHIO.

spent 12 years in practical tire making, having been connected with some of the largest Ohio plants; and H. H. Forrest, another practical tire man, is in charge of the tire and tube department.

It is stated that already plans are being made for increasing the capacity to 1,000 tires per day, these plans calling for the addition of a one-story mill and calender room of saw-tooth construction and three-story cutting, tire-building and storage rooms.

The company is capitalized for $1,000,000, $650,000 preferred and $350,000 common stock, the financing of which has now been practically completed.

* * *

Since 1910-11, when the Firestone Tire & Rubber Co. moved into its new factory, the sales have grown from $7,462,581.17 to $25,187,884.33, making a total increase of 257 per cent for the past five years. This past year, 1915-16, the increase to June 1 was 38 per cent over the showing of 1914-15. Since the new factory was erected five years ago it has been tripled in size. This has been done, wing by wing, these additions being made without loss in production efficiency.

The annual picnic of the Firestone company was held on Saturday, July 29. In the morning special cars carried the Firestoneites and their families, numbering around 25,000, to Silver Lake Park, near Akron. A soccer football game and a baseball game between department heads were keenly enjoyed by both participants and spectators. Following bountiful midday refreshments, varied athletic events provided wholesome fun until time for the evening display of fireworks, which were shown on the island in the center of the lake.

* * *

At a meeting of directors of the Portage Rubber Co., on July 11, the capital stock of the company was increased from $1,250,000 to $3,000,000, $1,500,000 of this increase to be issued and disposed of as common stock and $250,000 as preferred stock.

* * *

The employes of the Miller Rubber Co. held their annual outing at Silver Lake Park on Saturday, July 15. The picnic was largely attended and the day's sport proved highly enjoyable, a baseball game being the chief feature.

* * *

The books of The B. F. Goodrich Co. were closed on July 1, for the purpose of determining the result of operations for the first six months of 1916. They have not been audited by public accountants, but the company's auditor has submitted to the directors a statement of earnings for the period. After making proper provision for maintenance charges, depreciation, doubtful accounts, and all known outstanding current liabilities, the net profits for the period amounted to $4,800,000.

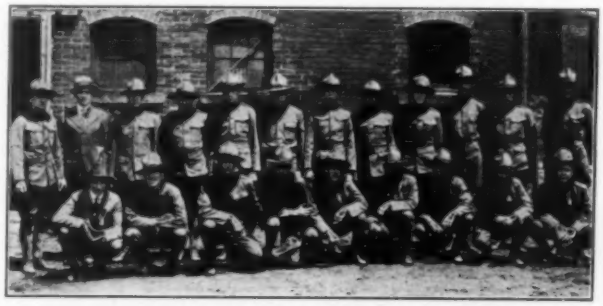
The Goodrich company is the first among our rubber factories to adopt the weekly pay system for its employes. Heretofore the workers have been paid semi-monthly, and under that system new workmen had to wait three weeks before drawing any money, as the first pay was held back. This meant hardship in many cases, especially among out-of-town workers who arrived in Akron with only a small amount of money.

* * *

The Goodrich and Goodyear companies gave $15,000 each to the recent campaign for Akron hospitals. A. H. Marks, vice-president of the Goodrich company, donated $25,000, and C. B. Raymond, secretary of the same company, gave $10,000. F. A. Seiberling, president of the Goodyear Tire & Rubber Co., also gave $10,000.

* * *

The factory school of the Goodyear Tire & Rubber Co., organized originally for the benefit of the workers in several departments, has been so successful that the classes are now thrown



GOODYEAR EMPLOYES NOW AT THE FRONT.

open to all employes of the company. Those wishing to improve upon their early education can do so, by means of these classes, in common school and high school subjects, arranged at convenient hours; while in the citizenship classes, men of alien birth are taught the fundamental principles of our government, the geography of the country, and the subjects necessary to make them intelligent citizens.

Lucian L. King, advertising manager for the Goodyear Tire & Rubber Co., Akron, Ohio, who is a member of the Hospital Corps of Battery "B," Ohio Field Artillery, has been detailed to special duty in inaugurating a publicity campaign to stimulate enlistment in the National Guard.

* * *

The capital stock of the Punctureless Auto Tire Co., at Barberton, Ohio, has been increased from $100,000 to $1,000,000.

* * *

The Phoenix Rubber Co. is the name of a newly organized concern to locate in East Akron. The company will make molded specialties.

* * *

The rubber men who attended the outing of The Rubber Club

of America, Inc., on July 18, were greatly pleased at the smoothness of the arrangements whereby they were transported to and from Akron in the special cars under the direction of Messrs. H. S. Firestone, W. O. Rutherford and C. B. Raymond. Akron was represented by nearly 40 members of the trade and probably had a larger showing than any city except New York and Boston. They were handsomely entertained by members of the Boston trade during their visit to that city.

THE RUBBER TRADE IN BOSTON.

By Our Regular Correspondent.

AN event of interest in the trade was the Shoe and Leather Market-Fair which was held in the Mechanics' building the second week of last month. Taken as a whole, it was much less a shoe fair than a leather fair, for there were few shoe exhibits. There were, however, quite a number of rubber manufacturers who had exhibits, most of these showing heels and soles. The number of people manufacturing these is evidence of the increasing use of rubber or compositions containing rubber, to replace leather in footwear. This is, of course, largely due to the excessively high cost of leather, but it is also, in a measure, due to the growth of appreciation of rubber for this purpose by the public.

Among those who exhibited at the fair was the Foster Rubber Co., which for many years has manufactured the "Cat's Paw" heels and is the manufacturer of rubber soles. This exhibit was in charge of William Noll, the enterprising sales manager of the concern, who made a good showing of the many shapes and styles of heels and soles made by this concern, the samples being arranged on the hinged leaves of a huge book. An amusing animated sign, advertising the "Cat's Paw" heel, showed the black cat trade-mark of the company, which by mechanical action humped its back and lifted its paw at regular and frequent intervals. A good display was also made of the "Red Plug Spring Step" heel which this company is now handling for the jobbing trade.

The Essex Rubber Co., Trenton, New Jersey, had a fine display of its rubber fiber and fiberized soles and heels. The booth was attractively arranged. Large artistic pictures were shown at the back, labeled "Business," "Pleasure," "Safety," "Service," showing, respectively, the business man, with a city background, a yacht at full sail, a policeman at a street corner, and a girl tripping along gaily in the rain.

The exhibit of the Plymouth Rubber Co., Canton, Massachusetts, was in charge of W. H. Mott. Its advertised line of "Slipknot" rubber heels was featured by means of a big gilt sign in the shape of a heel, and properly lettered. The company showed a line of plain plug heels for manufacturers to use on their shoes; also soling and patches for cobblers' use, a line of rubber boot heels and a line of "Durable Kompo" fiber, and rubber soles and "Bantam" soles of rubber and fiber. A novelty was shown in a shoe in which not a particle of leather was used. The top was of shoe cloth, the vamp of "Plymouth Leatherette," the sole of "Durable Kompo," with "Slipknot" heel and inner sole of "Gem" duck—everything, except the counter, the product of the Plymouth Rubber Co.'s factory.

The Avon Sole Co., Avon, Massachusetts, which claims to be the pioneer in making a shoe sole of leather fiber and rubber combined, had a display of its "Du-Flex" sole and "Avon" fiber sole, both being guaranteed to outwear the best oak sole leather. This company claims to use only the best plantation rubber in its compounds, and exhibited samples of first latex and smoked sheet rubber. The exhibit was in charge of C. B. Packard.

The I. T. S. Rubber Co., Elyria, Ohio, exhibited a novel style of rubber heel, it being molded convex on the tread and concave on the part attached to the heel, this shape being adopted that the heel might lie flat and close, with a tight joint, even without cementing, when attached. The claim for this heel is that because of this shape the nails can be placed nearer the center, and therefore the heel will stand more wear before the heads of the nails are exposed, thus giving longer wear and less liability of damage to floors. This company also showed a novel way of packing heels, the carton being so labeled that whatever side is presented to view on the shelf, the contents of the carton can be easily and quickly read, the boxes being square, the sizes marked on all four sides, right side up and up side down, and the exact pattern of the heel shown on both top and bottom. This exhibit was in charge of J. G. Tufford, the inventor of this heel.

The B & R Rubber Co., North Brookfield, Massachusetts, had an exhibit of its "Armortred" rubber soles, in white, gray and tan. The company claims these soles to be 25 to 50 per cent lighter than the average rubber sole. The "Barco" brand was also exhibited, a lower-priced rubber sole made expressly for shoe manufacturers, who, if they so desire, can have their names placed upon the sole.

The Oko Rubber Co., Campello, Massachusetts, exhibited a series of samples showing the gradual changes from the pure rubber sole to the fiber sole it is now manufacturing, and which is made of cotton felt with only 5 to 8 per cent of rubber as a binder. It is claimed that this sole is neither a rubber nor a leather sole, but that it will outwear either, will not crack or break, and is absolutely waterproof. The exhibit was one which was viewed with interest by many because of this practical demonstration.

The Fellsway Rubber Co., Medford, Massachusetts, exhibited its "Walkmore" soles and heels, manufactured expressly for the findings trade. These soles are made of flax and cotton fiber combined with rubber and are claimed to outwear leather, can be stitched without breaking, and are claimed to be superior to either rubber or leather soles. The "Walkmore" heels, unlike many other heels exhibited, also contain fiber.

Perhaps the handsomest booth at the fair was that of The B. F. Goodrich Co., Akron, Ohio, which was effectively decorated so that it seemed a veritable flower garden. M. M. Davis had charge of this exhibit, in which there was a fine display of the Goodrich company's "Textan" soles, which were pronounced to

EXHIBIT OF THE B. F. GOODRICH CO. AT THE SHOE AND LEATHER MARKET-FAIR.

be of fiber and rubber, just enough rubber being used for a binder. This sole is being exploited by means of extensive advertising and is being adopted by many shoe manufacturers on certain lines of their goods. A number of handsome shoes were exhibited with "Textan" soles. This company also exhibited the O'Sullivan rubber heels which, although not marketed, are manufactured by the Goodrich company. Incidentally, it was stated to your correspondent that the company recently made one shipment of 30 tons of O'Sullivan rubber heels.

The Federal Rubber Co. of Illinois, Cudahy, Wisconsin, exhibited a line of "Pennant" fiber soles and "Pennant" fiber and rubber heels for shoe manufacturers and "Rugged" fiber soles and heels for the jobbing trade.

In the booth of the Panther Rubber Co., of Stoughton, Massachusetts, was a striking representation of its trade-mark, being an immense, stuffed panther. Among the heels which were shown were the "Triplug," "Panther Tread" and "Indian" brands. The "Indian" and "B. B." soles were also shown, the "Indian" sole being guaranteed to such an extent that if a sole goes wrong the company pays for the whole shoe, while with the "B. B." soles, if any trouble results, the company pays for the sole. The Panther company also showed a line of coated duck for making "Gem" inner soles, and exhibited a heater which it furnishes to customers for use in manufacturing these inner soles from the Panther company's mill. This concern distributed advertising fans which were very popular during the heated term which lasted all through the week of the exhibit.

The Goodyear Tire & Rubber Co., Akron, Ohio, had a very extensive exhibit of shoes made by prominent manufacturers, with the Goodyear "Neolin" soles attached; also a line of "Wingfoot" heels. This company distributed diminutive sample soles of "Neolin."

The Hood Rubber Co., Watertown, Massachusetts, was the only concern to exhibit rubber footwear on this occasion. The booth was in charge of William B. Laighton, manager of the Hood company's export department. The exhibit consisted of a large variety of rubber and tennis footwear, the regular line manufactured by the company, and there were samples of Para biscuit and plantation rubber. This booth was a center of attraction when Mr. Laighton distributed little silver-plated charms in the shape of Hood rubber boots and storm slippers.

At the United States Rubber Co.'s booth, in charge of F. T. Ryder, was a fine exhibit of this company's new "Rinex" sole, in black, white and tan. This sole is made at the Revere Rubber Co. factory at Chelsea, Massachusetts. At this exhibit a large number of diminutive pin badges in the shape of flags, containing the United States company's trade-mark, were distributed and many hundreds of these were given away, thus popularizing still further the trade-mark of the company.

In the same booth were exhibited the various specialties of the Revere Rubber Co.'s shoe supply department, which is the successor to the Walpole Shoe Supply Co., this portion of the exhibit being in charge of J. N. Moulton.

Although the concern known for years as the Hub Gore Makers is now a part of Everlastik, Inc., New York City, still, as far as the shoe trade is concerned, the old name is used, thus preserving the identity and the words on which thousands of dollars have been spent in advertising. This concern exhibited a large number of styles of footwear in which elastic goring was used, some novel forms being shown. The one most noticeable was a new automatic shoe which was worn by a lady demonstrator who exhibited its workings to all interested visitors. This shoe has a lattice of little wires on either side of the opening of the shoe. A sliding key is pulled up and the lattice is interlocked. When pulled down it is unlocked. It is evident that such a shoe would not be satisfactory unless it fitted perfectly, and to insure a proper fit, for large or small ankles, an insertion of elastic goring is used. There were shoes shown having the entire top of Everlastik cloth, and pumps in which some webbing was used; also, the "Gardiner No-Wrinkle" turned shoe, which has a piece of goring in the lining of the heel, thus enabling the shoe to be turned without breaking or wrinkling.

The Peters Manufacturing Co., of New York and Boston, which does a business in backing cloth and thin leather by means of gutta percha cement, showed various samples of its work in this line and demonstrated the advantages of its methods by means of a testing machine showing the number of pounds pressure necessary in order to burst a hole in these various backed leathers and fabrics.

The American Wringer Co., Woonsocket, Rhode Island, exhibits a full line of its rubber-covered rolls and bolsters for tanning machinery.

The Dexter Manufacturing Co., of this city, exhibited a line of rubber cements for shoe manufacturers.

The Fibre Hide Filler Co. exhibited a filler of ground cork and rubber cement for sole filling; also a machine for demonstrating the manner of use of the filler.

Taken altogether, it will be seen that this was quite a rubber fair, as well as a leather fair. The attendance was large, and it is stated that a large amount of business was accomplished with visiting shoe manufacturers.

* * *

The Boston Woven Hose & Rubber Co., Cambridge, had a special exhibit at the annual convention of the National Retail Hardware Association, held at Mechanics' Hall a month or two ago. Specimens of crude Para and plantation rubbers were shown, as were also finished sections of the various lines of

EXHIBIT OF THE BOSTON HOSE & RUBBER CO. AT THE HARDWARE CONVENTION.

hose this company manufactures, and samples of its fruit jar rings and spray nozzles. In connection with the convention, the company's motion picture film, "The Story of Rubber; What It Is and What It Does," was shown, thus affording dealers an opportunity to see how the products exhibited were manufactured.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

THE rubber factories in Rhode Island continue to be rushed with work as they never have been before, while orders continue to pile up in a manner that indicates full time schedules for months to come. Rubber goods of every description are wanted, and the factories are shipping large consignments of their products daily. Additions and improvements are being made to the factory, machinery and equipments. The prevailing scarcity of help has for many months proved a severe handicap to manufacturers.

* * *

The movement started by friends of the late LeBaron Carleton Colt to secure funds for the purchase and equipment of a memorial ambulance, is meeting with considerable success, and it is expected that the desired amount will soon be in hand. It was at first proposed to found a free bed in memory of Mr. Colt at the Rhode Island Hospital in Providence, but the committee decided that the ambulance would serve the people of the town

of Bristol to better advantage, and arrangements were accordingly made to receive contributions, especially from among the officers and employes of the National India Rubber Co.

The ambulance, which will cost about $5,000, will be housed at the National Rubber company's plant, in readiness to respond to call, whenever needed. The executive committee having the matter in charge consists of James W. Franklin, chairman; Edward E. Bunn, secretary; Wendell R. Davis, treasurer; Arthur H. Emerson, Robert W. S. Cox and Frederick L. Dunbar.

* * *

The F. O. B. Club, composed of employes of the Revere Rubber Co., Providence, held an outing and field day at Emery Park on July 1, the affair being a great success. The program consisted of a chicken dinner and outdoor sports, including a baseball game between the married and the single men, which was won by the Benedicts, by a score of 12 to 4. There were 65 in the party.

* * *

The practical side of modern efficiency was demonstrated at the Alice mill of the Woonsocket Rubber Co., and later at the Millville plant of the same concern, during the past month, where a dozen of the traveling representatives from the branch stores of the United States Rubber Co. were engaged in learning the rudiments of the rubber business. The salesmen came from Chicago, New York City, Baltimore, Buffalo and Boston, and spent several weeks in learning how rubber shoes, arctics and boots are made.

* * *

Early in the past month the property in Bristol, originally occupied by the Byfield Rubber Co., and later by the Consumers' Rubber Co., was transferred to the Narragansett Rubber Co., of which Terrence McCarthy holds the controlling interest. The transfer was consummated through the receiver in charge of the settling of the affairs of the Consumers' company, which became involved in bankruptcy proceedings following the suspension of the Atlantic National Bank of Providence some three years ago.

Mr. McCarthy reports that the business of the Narragansett Rubber Co. is constantly on the increase, the demand, being especially large for tennis shoes. A large quantity of these are being shipped every day to customers of the concern in the West and Southwest.

* * *

The International Rubber Co. is making extensive alterations, additions and improvements at its plant at West Barrington, among the most important being the erection of new buildings for the enlargement of the carriage cloth department, the demands upon which have increased many-fold within the past year. One large new wooden building has just been completed and is being equipped, and other buildings are to be erected at an early date.

* * *

The Goodyear Tire & Rubber Co. has taken the store at Federal and Tower streets for salesrooms. There is a big rear section for a shipping and delivery room, while the cellars have storage capacity for 6,000 tires.

* * *

Notices were posted during the month at the factory of the National India Rubber Co., Bristol, for a shutdown of the plant for twelve days for the purpose of a general stock-taking, in accordance with orders from the managing director, George Schlosser. The last day of making will be Tuesday, August 22, and the factory will resume operations for the first day of making on Wednesday, September 2.

* * *

The BeSaw Tire Co., 46 Franklin street, Providence, is being conducted by Frederick L. Scott, of 316 Pawtucket avenue, Pawtucket, and Adolf W. Schaick, of 257 Broadway, Providence, according to their statement filed at the City Clerk's office.

* * *

C. Schoos & Son have recently installed a complete vulcanizing equipment in their place of business, Quidnick street, Arctic, for all kinds of work on tires, inner tubes, etc.

* * *

William McCaw, assistant treasurer of the Lee Tire and Rubber Co., Conshohocken, Pennsylvania, formerly a resident of Bristol, spent several days the early part of the month at his old home.

THE RUBBER TRADE IN TRENTON.

By Our Regular Correspondent.

MANUFACTURERS of rubber machinery continue to be handicapped by a scarcity of workmen. The molders have been on a strike for several months, and the end of the trouble is not in sight. The machine plants are all running with reduced forces, whereas they have sufficient business to keep a much larger number of operatives busy. It is necessary to have a detail of special police escort the "open shop" workers to and from their homes. This is a particularly unfortunate condition, coming as it does at a time when orders are so plentiful.

* * *

The DeLion Tire & Rubber Co. has completely recovered from the effects of its recent fire. The plant has been rebuilt, in larger dimensions than the original structure.

* * *

The Essex Rubber Co. has awarded cash premiums to those of its employes who took advantage of the concern's educational inducement feature, by attending night schools during the last term. The attendance for October, the largest month, was 18. Of these, 13 took the English course. More than one hundred dollars was expended by the concern in making the awards. It is thought that a larger number of employes will take advantage of the plan next season. Most of last season was devoted to getting the work under way. It is figured by the company that any employe who is willing to devote his evenings to study will most likely prove a more efficient operative because of the more intelligent use of his time. The offer of the company was not made in a narrow spirit, for it rewards its employes even though they take up technical work entirely foreign to the rubber trade.

The Essex company recently gave United States flags to 350 employes for the purpose of stimulating patriotism.

* * *

The Lambertville Rubber Co. will begin operations shortly on the erection of an addition to the plant, to cost several thousand dollars. Plans have been drawn, and when the work is started it will be pushed to completion to help take care of the coming season's business. This company has had an unusually successful season. An entirely new line may be added to the company's output following the completion of the new building. The nature of the new line will shortly be announced.

* * *

The employes of the United & Globe Rubber Manufacturing Cos. have formed an organization known as the U. & G. Athletic Association, having for its object the furtherance and promotion of various sports.

A constitution and set of by-laws have been adopted and the following officers elected: John S. Broughton, honorary president; George W. Skirm, president; Daniel M. Henry, vice-president; Joseph D. Connelly, secretary and treasurer.

The association has secured a room at the Central Y. M. C. A. in which to hold their regular meetings once a month.

RUBBER TIRES LEND THEMSELVES TO A SCHEME OF DECORATION in a Little Rock, Arkansas, drug store, where the proprietor has dressed his soda fountain with tires, headlights and steering wheel. He claims that it attracts business, not only from automobilists but also from others.

The India Rubber Trade In Great Britain.

By Our Regular Correspondent.

JUDGMENT has now been delivered by the House of Lords (the unusual number of eight law lords sitting) in the action of the Daimler Co., Limited vs. the Continental Tire and Rubber Co. (Great Britain), Limited, in favor of the plaintiff company. The Continental company brought an action to recover a debt for tires supplied to the Daimler company, which refused to pay on the ground that the Continental company was an enemy firm. Both the Court of First Instance and the Court of Appeal decided in favor of the Continental company, because it was registered in England, although 24,999 of its 25,000 shares were held by subjects of the German Empire, who reside in Germany. The final Court of Appeal has now upset this decision and decided that the Continental company cannot sue the Daimler for the money due during the period of the war. This decision is of considerable importance as it has been taken as a test action with regard to numerous other companies of the status of the Continental.

CHANGED TAX REGULATIONS.

The extra tax proposed in the last budget on private motor cars has been abandoned, and an additional tax of 6*d*. per gallon on petrol substituted for it. Further, there are special regulations relating to the purchase of petrol by car owners, all of which have the object of still further reducing the use of motor cars for pleasure. Commercial motor vehicles and parts thereof have now been put on the list of prohibited imports.

TRADE DISPUTE SETTLED.

The long drawn-out dispute at the Premier Rubber Works, Manchester, has now been amicably settled, a standard price list having been arranged between the Waterproof Garment Manufacturers' Section of the India Rubber Manufacturers' Association and the United Garment Workers' Trade Union.

ROYAL AGRICULTURAL SOCIETY EXHIBITION.

This year's show was held at Manchester at the end of June and proved a great success, both as regards exhibits and attendance. With respect to rubber there is not much to report, as owing to the embargo put upon the exhibition of tires of any sort by the Ministry of Munitions, many rubber manufacturers who would otherwise have had a general display did not exhibit. The only manufacturer who had a stand was the North British Rubber Co., Edinburgh, which made a comprehensive exhibit of hose used for various purposes connected with agriculture, also driving belts for machinery. A few waterproof garments were also on view, but here the firms dealing with the wholesale trade only, did not attempt to rival the exhibits of the retail firms, such as the Palatine Rubber Co., of Manchester; J. H. Peck & Co., of Wigan; Davis & Co., of Oxford, who had exhibited collections of waterproofs, rainproofs and oilskins. Exhibitors of this sort are about the only people who smile when the weather breaks after a bright morning, as they make a large number of sales among those who have come unprovided. James Wilson & Co., of Manchester, had a good display of waterproof covers of every description, carriage rugs and oilskins, here as elsewhere, being much to the fore.

Some buildings were roofed with Ruberoid, which is a British invention of earlier date than its rival, the asbestos slate. The name and plasticity of Ruberoid might lead to the supposition that it contained rubber. This, however, the makers, the Ruberoid Co., Limited, Brimedown, Middlesex, expressly disavow, stating that it is a special form of bitumen and felt.

The mechanical milking apparatus, which is by no means novel, attracted a good deal of attention this year, owing to the scarcity of farm labor. A considerable amount of white and red one-inch and half-inch rubber tubing is required for the equipment.

THE CHEMICAL OUTLOOK.

The recent break in the high prices which have ruled for some time in the case of many chemicals, and more especially metals, is welcome to those who are not contracted far ahead. This break is attributed, rightly or wrongly, in many cases, to increased production in America, where factories have been rushed up regardless of cost. Of course, the fall in the market quotations for zinc and lead is not immediately reflected on compounds like zinc oxide and litharge, but buyers who will be in the market shortly are expecting better terms than they obtained a few months ago. Solvent naphtha has slumped considerably from the contract prices of six months ago. It is noticeable that some of the chemicals which have been coming to us from across the Atlantic are now being bought at much more favorable prices than six months ago, while others, notably carbon black, maintain their inflated price level. One result of the war will be a coördination and more general working together of our chemical manufacturers than has been the case in the past, when each firm kept its doings to itself. A powerful chemical manufacturers' association has been formed, including most branches of the chemical industry, and this association will be in a position to present its views forcibly to the government of the day.

According to statistics, America has increased her output of barytes to a much greater degree than we have since German supplies fell off. Before the war we produced about 50,000 tons per annum and imported about an equal amount from Germany. The imports had developed, not only because of the finer grinding and other preparative machinery, but because the German deposits generally are of more uniform purity. Our deposits are in many cases of somewhat variable constitution, other earthy minerals being apt to intrude, and lower the grade, thus leading to increased cost of production.

FOUNDER OF THE INDIA RUBBER JOURNAL.

Mr. Herbert Standring, who has been known to the rubber trade for more years than perhaps he cares to remember, and who has, since the war broke out, been connected with the mechanical transport section of the Army Service Corps, has now returned to business life as the representative of Messrs. Laughton & Sons, of Manchester, for London and the southern counties. This firm, which deals in reclaimed rubbers and substitutes, is the one which I recently reported to have taken over the Holt Town Rubber Co., Manchester, formerly belonging to the late Mr. Openshaw.

TRANSPORTATION OF RECLAIMED RUBBER.

Although in the great bulk of cases the regulations for the carriage of various commodities by railway are very much the same in Great Britain and America, there are some notable exceptions. Reclaimed rubber, for instance, is evidently considered as more dangerous in America than it is in England. The following is the American regulation for rubber shoddy, regenerated or reclaimed rubber. It must be packed in tight metal containers or in wooden boxes, complying with shipping container specification No. 17, except when in the form of dense homogeneous non-porous sheets or rolls, the sheets of thickness of ⅛ inch or greater, packed flat or in rolls.

Rubber scrap, if ground, powdered or granulated, whose rubber content exceeds 45 per cent as determined by subtracting the sum of the per cent ash and the per cent acetone extraction from

100, must be packed in tight metal containers or in wooden boxes, complying with specification No. 17.*

The British railway regulations do not put reclaimed rubber on the special list of dangerous goods, though it is stated that india rubber and india rubber substitute, shredded or finely divided, must be packed in approved tarpaulin bags or in air-tight and damp-proof casks or cases.

The difficulties put in the way of carrying reclaimed rubber by some of our shipping firms have arisen from existence of the American railway rules, as nothing seems to be known in railway and shipping circles in Britain about any latent dangers attaching to reclaimed rubber. I don't say that the American rules are needlessly stringent, or that there is no cause for alterations to be made in Britain. I merely wish to draw attention to the difference in existing regulations. As reclaimed rubbers are by no means of uniform composition, and are prepared in different ways, it would seem that as regards liability to spontaneous combustion they should be sub-classified and not all lumped together under one general heading.

EXPORT PERMITS AND RUBBER PRICES.

A Far Eastern contemporary has published an extract from a letter from a leading firm in London in which the recent fall in crude rubber prices in the London market was attributed to the great difficulty in obtaining permits to export.

It seems that a certain individual or firm put in an application for permits to export large quantities of crude rubber to America, and succeeded in obtaining them, whereas at the time they were not in possession of any rubber or orders for rubber. It appears that after having obtained these permits they placed themselves in communication with various large American buying houses, soliciting orders, pointing out that possessing these permits, they were able to make more prompt shipments than other concerns could effect after receiving orders. Other buyers for the American market learning of this, promptly brought the matter to the notice of the authorities with the result that a number of additional restrictions and further difficulties soon attended the obtaining of permits involving very considerable delays. The writer of this letter says that it would appear that the authorities had gone from one extremity to the other and that representations had been made to the authorities, which it was hoped would result in an improvement in this matter.

THE RUBBER TRADE IN HOLLAND DURING 1915.

UNITED STATES CONSUL FRANK W. MAHIN, Amsterdam, Holland, reports that the rubber market in Amsterdam would have been at a complete standstill in 1915, had it not been for the efforts of the Netherlands Overseas Trust to induce the Entente Allies to permit the shipment of rubber into the Netherlands, for the use of the domestic industry, which required larger quantities than before the outbreak of the war, and which is steadily expanding.

The monthly public auctions at which Dutch East Indies rubber was formerly sold at Amsterdam have been discontinued since August, 1914, when the Batavia rubber market practically took their place. The exports of rubber from Amsterdam to the United States decreased from $534,805 in 1914 to $98,960 in 1915.

No reliable data are available regarding the actual stock of crude rubber on hand at Amsterdam at the beginning of 1915, nor is there any information that can be furnished regarding imports and prices obtained. Brokers state that prices were higher than at the London market and were irregular. It is said that the highest price during the year for prime *Hevea* rubber, which was the quality most in demand, was about $1.04 per half kilogram (1.1 pounds), and the lowest about 70 cents.

*While our correspondent is correct as regards our railroad regulations for scrap and reclaimed rubber, the fact remains that little or no reclaimed rubber is shipped except in sheets or rolls, and scrap rubber seldom in powdered form.

THE RUBBER TRADE IN GERMANY.

By Our Regular Correspondent.

CONDITIONS do not improve, but our enemies must not for a moment imagine that our position is hopeless. Our great naval victory that was a serious blow to Britain's sea power, should open their eyes.

Official statistics, reports by chambers of commerce and other commercial and industrial organizations, as well as many trade manufacturing and local publications having ceased to circulate, all information concerning trade, commerce and general conditions in the different parts of the Empire is fragmentary and you must, therefore, pardon the desultory information and the unconnected style of the letters I may be fortunate enough to get through to you.

RAW MATERIALS.

Our rubber industry continues to suffer from the lack of raw materials, especially crude rubber, but it manages nevertheless to meet practically all demands by using compounds of reclaimed and synthetic rubber with small proportions of crude rubber.

Other compounding ingredients are not lacking, but their prices are very high.

Ducks and other fabrics used in the rubber industry are also very expensive and their use greatly restricted by governmental decrees.

Chemicals used in reclaiming are scarce and very costly, and their use is strictly regulated and supervised.

SYNTHETIC RUBBER A SUCCESS.

The manufacture of synthetic rubber has been placed on a basis that is commercial under the existing conditions. Many experts go so far as to predict that, before the end of the war, we will have made such progress that we will be able to produce this material, when peace is reëstablished, in competition with the natural product and at such prices as to displace crude rubber partially, if not entirely. They predict for the rubber plantation, as well as for the wild rubber industry, the same fate as that which befell the indigo industry, not many years ago, when synthetic indigo was first brought out by Germans and in a short time completely destroyed the trade in the natural East Indian product. Of course this may seem very optimistic to you, but it cannot be denied that wonders have been accomplished by our chemists and by those who have helped them in making their discoveries industrially practicable.

TIRES.

Our armies continue to use rubber tires in ever increasing quantities and these are all being made of compounds containing synthetic, reclaimed and crude rubber, the latter in much restricted proportions.

Much has been done since the outbreak of the war, and especially in the last six months, to facilitate the use of steel-tired motor road vehicles in private enterprise. New speed limits have been fixed for these steel-tired vehicles; motor trucks and trailers, not weighing more than five and a half metric tons, empty, are now allowed to travel at as high as 15 kilometers (9.32 miles) per hour in open country and 8 kilometers (4.97 miles) per hour in towns. Only one trailer may be hauled by a steel-tired motor truck, and the speed in that case must not exceed 12 kilometers (7.46 miles) and 8 kilometers (4.97 miles) per hour in country and town districts, respectively.

These rules permit the extension of the private use of motor trucks that had been practically stopped by the restrictions in

the use of rubber tires, but regulations cannot relieve the machinery of these vehicles of the heavy strain and vibration caused by rigid tires at such speeds, and it is not likely that there will be any permanent developments in steel-tired motor vehicles for road use. Steel tires must do the work under present conditions, but after the war, when conditions again become normal, the great majority of users will go back to resilient rubber tires which insure economic operation such as can never result from the use of rigid tires.

TRADE.

The demands of the army and navy are so large that most of our rubber manufacturers, as well as manufacturers in many other lines, do not have time to worry about the civilian, foreign and domestic, trade that has been lost through the effect of the war.

FOREIGN TRADE.

Our foreign trade with neutral countries has become more and more limited, as a result of embargo, blockade, and contraband restrictions. Our trade with nations at war with us is naturally at a standstill since the beginning of the war. The success of our submarine merchantmen in landing dyestuffs in your country, however, has given us renewed confidence in overcoming these handicaps.

SHIPBUILDING.

Shipbuilding has been very active for the last year and is consuming much mechanical rubber goods, though practically all in substitute qualities.

MANUFACTURING.

The building trade continues to be stagnant and manufacturing industries that are not working for the war departments have very little to do.

AGRICULTURE.

Agriculture was never so important to us as it is today. The fact of the matter is, we feel that our salvation is to be found in our agriculture as much as in our arms. The shortage of food is acute in many sections of our country, but the coming crops promise to be plentiful and there are no immediate reasons to be over-anxious regarding the future.

LABOR CONDITIONS.

Labor conditions have now settled down to something like the normal. Female labor is largely taking care of lines of manufacture where male labor was formerly employed. Many industries have imported foreign neutral labor, mostly from Scandinavia and the Netherlands, and more than half a million prisoners of war are being employed.

The employment of prisoners has in fact largely limited the trade our manufacturers of machinery and rubber mechanical goods expected to do with the farmers; there being no real shortage of cheap labor, our agriculturists have not taken so readily to modern machinery as one could have expected them to. To be sure, more machinery is now used in our agriculture than formerly, but this is perhaps more due to the intensive development and the phenomenal growth of this industry since the outbreak of the war than to any other causes, shortage of labor included.

ORGANIZING FOR AFTER THE WAR.

Our leading industries are all seriously preparing for the commercial and industrial struggle that is sure to follow this war of blood.

Up to date nothing definite has been developed in our rubber industry, but our chemical manufacturers have formed a gigantic syndicate. This combine, which is for a period of 50 years, has for its object the safeguarding of the world-wide preeminence of our chemical industry. It will also enable its members to more easily bear their losses in foreign countries, which are estimated already at much more than $25,000,000.

The new chemical combine has a larger capital than any other of our numerous syndicates or "kartels." Sums varying between $50,000,000 and $100,000,000 have been mentioned as constituting this capital. The following firms constitute this chemical combine: Badische Anilin und Soda Fabrik; Leopold Casella; Chemische Fabriken Weiler-ter-Meer; Kalle & Cie; Farbwerke Höchst; Farben Fabriken Bayer; and Aktiengesellschaft für Anilin-Fabrikation.

SECRET PATENTS.

Until a few years ago the Imperial Government recognized what was known as secret patents, claims and specifications of inventions which were filed with the patent department, but not published, yet protected the inventors' rights. The growing of liberal business interests, however, in time disposed of this rather undemocratic institution. But now all are beginning to recognize the advantages of this discarded system, which will probably soon be reëstablished.

The keen commercial competition that is sure to follow the war makes necessary the protection of our national industries, and secret patents are well designed for this purpose. The compositions of the products we will place on the world markets after the war can well be determined by analyses, but these will be of little value as long as processes of manufacture can be kept totally secret.

LIMITATIONS ON RUBBER WASTE TRADE.

The Imperial Government has given to the following concerns the exclusive right to deal in rubber waste: H. Herzheimer, Florsheim; Martin Jacobsen, Berlin; F. H. Mayer & Co., Lubeck; Friedrich Walther Müller, Dresden; Eugen Perle, Breslau; Gebrüder Salomon, Hanover, and S. Salomon, Minden.

THE RUBBER TRADE IN JAPAN.

By Our Regular Correspondent.

ON account of greatly advanced cost of many compounding ingredients, 24 Japanese rubber manufacturers in Osaka, Kobe and other towns consulted together and advanced the prices of their manufactures 20 per cent, this advance to take effect the 1st of February. Tokyo manufacturers did not confer as an association, but each manufacturer raised his prices from 10 to 30 per cent because of these same reasons.

EXPORTS TO GREAT BRITAIN SMALLER.

Japanese manufacturers have received orders from Australia, British India, Straits Settlements, China, England, Russia and the United States. Among the goods which have been exported are tires, air pillows, rubber toys, shoe-heels, clothing, etc. Because of the British prohibition regarding rubber toys, Japanese exports of this line declined some 20 per cent from the previous year. In the matter of tires Japan sent to Great Britain last year, tires to the value of 513,518 yen [$256,759], and the first four months of this year 310,000 yen [$155,000], since which time none have been sent to Great Britain. These rubber tires were mostly manufactured for the military service, by the Dunlop Rubber Co., Limited, Kobe, Far East, which is a branch of the Dunlop Rubber Co., London. At the same time exports of valves for bicycles, motor cars and air bags which had been largely exported to England were also discontinued, and to further complicate matters, Great Britain placed export duties for export of iron and its manufactures, so that rubber machinery cost so much as to prohibit Japanese manufacturers from purchasing.

CHANGES AND ENLARGEMENTS.

Notwithstanding these untoward conditions, considerable enlargements have been made in Japanese rubber factories. The Azuma Rubber Works (Tokyo), burned last winter, was rebuilt on a new and larger scale in March. It manufactures rubber toy balls, rubber soles and heels. The Teikoku Rubber Co., Limited

(Tokyo), which was in financial difficulties last year, has been reëstablished by new members, to manufacture "tabi" or "zori" soles.

The Taiheiyo Rubber Co. (Tokyo) increased its capital to 30,000 yen [$15,000] in January. The Eastern Rubber Works (Tokyo) changed its capital to 15,000 yen [$7,500] in March, and the Fujikura Rubber Cloth Works (Tokyo) increased its capital to 200,000 yen [$100,000] in May, this amount being invested by Kenzo Okada and T. Matsumoto, leading members of the Fujikura Electric Wire & Rubber Co., Limited (Tokyo). The Cotton Belting Co., Limited, was established at Suma, Hyogo-Ken with a capital of 25,000 yen [$12,500] to manufacture cotton beltings and rubber goods, and the Nitto Rubber Co. was established in Nagoya for manufacturing rubber tires for bicycles, and is to commence manufacturing in a few days. The Komo Rubber Cloth Works (Tokyo), which was burned on the 20th of May, is to rebuild on a large scale. The Nihon Cristall Rubber Works (Tokyo), changed its title to the Shibuya Rubber Works on the 15th of June.

CRUDE RUBBER IMPORTS.

The imports of crude rubber from January to April, 1916, amounted to 2,359,084 yen [$1,179,542], increased 1,627,522 yen [$813,761], comparing it with the amount imported in the same period in 1915.

JAPANESE PLANTATIONS IN MALAY AND BORNEO.

Japanese rubber plantations in Malay aggregate 85,850 acres, on the 147 plantations, at the end of 1915, in which acreage 27,880 acres are already planted and some yielding their products. The Nanyo Rubber Co., Limited, which was established for rubber plantation in Johore with capital of 200,000 yen [$100,000] in December, 1910, doubled its capital in January of this year and purchased the Nanyo Oita Rubber Plantation Co., Limited, which was established for the same purpose in April, 1911, and planted 600 acres of total acreage, 1,301 acres. Thus the Nanyo Rubber Co., Limited, became possessors of a total acreage of 3,343 acres, 1,600 acres having been planted. On May 10 the Nanyo Rubber Cultivation Co., Limited, was established with 2,000,000 yen [$1,000,000]. One-fourth of the sum was paid in, and a Chinese rubber plantation was purchased next to the Fujita-gumi Rubber Plantation (Japanese) in Johore, the Fujita-gumi Rubber Plantation (established October, 1911), having 6,970 acres and having planted 3,797 acres. The total acreage of the newly purchased plantation is 6,630 acres, of which 1,790 acres are planted; that is, 150 acres of 6 and 7-year trees, 500 acres of 5-year trees, 700 acres of 3 and 4-year trees, etc. The plantation is yielding 50 piculs [666 pounds] a month, having 50,000 trees to be tapped and having 80 coolies and 50 workers.

In British Borneo there were no Japanese rubber plantations, but Mokutaro Yoneda had 1,000 acres and has now added to this. Fusanosuke Kuhara, one of the richest men in Osaka, purchased a plantation of 2,000 acres under the name of B. Tanabe, Mr. Kuhara's manager, paying therefor 180,000 yen [$90,000], in which acreage 500 acres are planted, 70 per cent with *Hevea* trees and 30 per cent cocoa. The rubber trees will yield next year.

RUBBER PLANTING IN FORMOSA.

Rubber planting in Formosa has been of questionable profit, for hurricanes visit the island once or twice a year, and the climate is not as good or beneficial for rubber growing as the Malay peninsula. However, as the trees seem to stand these handicaps, a few planters have interested themselves in producing rubber, more as a curiosity than as a business proposition. According to the reports from The Fujikura Afforestation Department and The Murai Afforestation Department, the plantations produced a fair quality of *Manihot*.

THE FUJIKURA AFFORESTATION DEPARTMENT.

The Fujikura Afforestation Department was established as an attribute of The Fujikura Electric Wire & Rubber Co., Limited (Tokyo), in the south part of Formosa, in 1912, and its acreage is about 2,400 acres, in which was planted teak, *Manihot*, *Hevea*, camphor-trees, red sandalwood trees, and some other tropical plants. Among these, *Manihot* and teak have proved best fitted for plantation growth. The results in June, 1915, are as follows:

Manihot, planted in May, 1913, is 30 feet high and one foot in diameter, two feet from the earth, and has shown better results than in plantations in Java. In two years and a half after planting, the *Manihot* in Formosa can be tapped.

Hevea, planted in May, 1913, in one year and a half attains a height of 15 feet, the growth being about as rapid as in Malaya for the first two or three years, but it seems to grow more slowly from three years on in Formosa.

In Formosa, *Manihot* is the most successful rubber tree. By the hurricane of 1813, buds, leaves, branches and even trunks of *Manihot* were broken off, and the authorities and planters thought that the rubber plantation in Formosa would be hopeless. But, on the contrary, the injured trees grew their trunks larger than before, making the tapping period earlier than was previously expected.

Formosa, situated within the Torrid Zone, is able to grow *Hevea* trees and will, undoubtedly, yield as beneficial a product as the plantations in Malaya, although the growth is slower compared with that of Malaya. Crude rubber exhibited at the Formosa Exposition of May, 1915, the product of *Hevea* trees in the official garden in Kagi, Formosa, was recognized as of good quality.

Though the percentage of loss in washing for Para rubber is less than that of *Manihot*, the latter is more beneficial in Formosa for the reason that it can be tapped at from two and a half to four years, while *Hevea* trees need from seven to ten years. So rubber planting in Formosa is promising, if confined to *Manihot* planted on the slopes of hills protected from hurricanes.

THE MURAI AFFORESTATION DEPARTMENT.

The Murai Afforestation Department, established in 1910 by Kichibe Murai, a wealthy resident of Tokyo, planted *Manihot* and camphor trees, the latter to protect the former from the hurricanes. The total acreage is 2,773 Ko [6,018 acres], a Ko (Formosan measure) being 2.17 acres, in which 452 Ko [981 acres] are planted, and 1,300 Ko [2,821 acres] will be taken to cultivate tropical plants, except the acreage for roads, bamboo forests, refreshed forests and necessary uses. The results of the afforestation to June, 1915, are as follows:

	Manihot.	Camphor Trees.
First (1912)—		
Planted trees	42,162	192,036
Complemental planted trees	41,325	183,371
Trees in June, 1915	42,163	192,038
Second (1913)—		
Planted trees	36,220	189,100
Complemental planted trees	17,597	141,205
Trees in June, 1915	36,220	189,100
Third (1914)—		
Planted trees	52,769	2,248
Complemental planted trees	5,701	450
Trees in June, 1915	34,915	2,248

When finishing the complemental plantation, camphor-trees will aggregate 383,384 and *Manihot* and *Hevea* 131,152, besides a few tropical trees, such as coffee, orange, teak and others.

Planting on the remaining 1,300 Ko [2,821 acres] has been postponed until results from present plantings prove financially successful.

NEW TARIFF FOR MOTORCYCLES AND RUBBER TREES.

The Diet of Japan in the spring passed two new customs tariffs, one for motor cycles and the other for rubber trees, as follows:

	New Tariff.		Old Tariff.	
	Yen.	United States Currency.	Yen.	United States Currency.
Motorcycle (combined with engine) *each*	93.60	$46.80	93.60	$46.80
Motorcycle (without engine) *each*	77.60	$38.80	16.60	$ 8.30
Rubber trees	Free		15% ad val.	

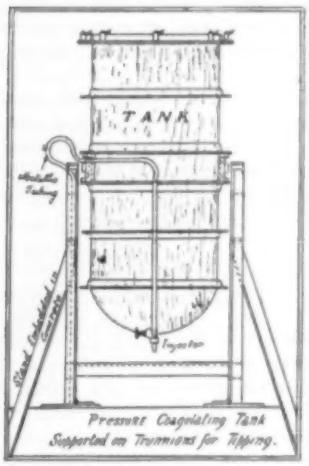
PATENT REGISTRY.

The Diet also decided that the terms of "New Idea Registry" of the Japanese Government shall be extended from six to ten years, but the duration of patents will continue to be 20 years.

THE ILCKEN-DOWN COAGULATION PROCESS.

IN the March, 1916, issue of THE INDIA RUBBER WORLD, a brief description was given of the Ilcken-Down method of coagulation. Since this process was introduced last October, several improvements have been made. One factory has been working this process for some months, and others are now beginning to use it. Some of the leading estates on the Peninsula have ordered tanks, to test the process on a large scale.

Briefly described, the improved process is as follows:



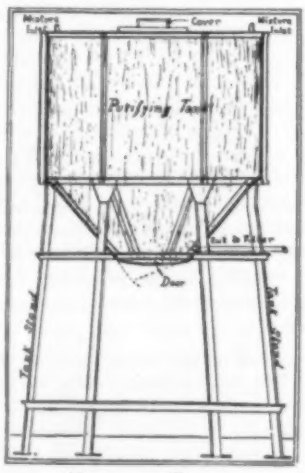
PRESSURE COAGULATING TANK.

The fresh latex is strained into a tank, whence it runs into a second tank fitted with a stirrer and a cover, where it receives one-tenth of an ounce of glycerine to every gallon of latex, and is thoroughly stirred. As soon as the latex has coagulated, which will occur in from six to eight hours, and is visible by a soft, spongy clot having formed containing nearly all the serum, a mixture composed of any of the following agents: A—alcohol and B—petroleum-benzine, or A—alcohol and B—gasolene, is forced into the tank by means of an injector fitted at the base, and envelops the soft coagulum. It is found that good qualities of denaturated or methylated spirit and benzine give most satisfactory results.

The time taken to transform the latex depends on the nature of the latex. The purer and the richer the latex, the quicker will it be transformed into a soft clot by the action of the glycerine, in which will be developed a certain bacterium called "Sorbose" bacterium, transforming the glycerine into dioxyacetone and the dioxyacetone fermenting the enzyme action into ethylalcohol and carbon dioxide. On a large scale it is recommended that engine power be used for stirring for about five minutes. When stirring is completed, the stirring apparatus is removed from the tank, which is then covered.

When this clot is formed, the mixture of methylated spirit and benzine is gradually added to the latex, until a quantity of not less than 2 ounces per gallon of latex has been injected round the clot, thoroughly enveloping it.

Complete precipitation of the coagulum will have taken place and the serum is sufficiently clear in about 12 hours. The serum is run off and the hard coagulum may then be removed from the tank and made into slabs or crêped.



PURIFYING TANK.

After removing the rubber from the tank a certain amount of pure rubber in the form of fine flour (less than one per mil of the dry rubber weight) will be found in the tank. This should be poured into a clean cylindrical receptacle with tap at bottom and treated by separation in the ordinary way. The flour floats on top, and the serum is run off.

It should be borne in mind that all delay that may arise from time of tapping to collecting and treating the latex with glycerine affects its coagulation. Therefore, to insure the best results the collection and treatment with glycerine should be done expeditiously, the spongy clot frequently forming in 6 hours.

For small estates zinc or earthenware column-shaped tanks about 6 inches diameter and 18 inches high, to treat 1 to 1½ gallons of latex, each, can be used. For these small tanks an injector is not necessary. The mixture is merely poured on the coagulum, and the tank is turned round by the hands in a circular direction from left to right and from right to left, thus insuring complete envelopment of the coagulum by the mixture.

NITRE CAKE IN RUBBER RECLAIMING.

ALMOST every type of rubber scrap is today treated for recovery. These types are generally divided into three general classes, fabric free, fabric bearing and ebonite.

Fabric bearing material includes such scrap as belting, hose, overshoes and auto tires. Preliminary to depolymerization and softening all fabric must be destroyed and removed. The fabric is usually cotton and is by various reagents changed into such a form that it may be removed by washing with water. The three principal methods of accomplishing this are the mechanical, the alkali and the acid. In the first method, which is now little used, the scrap is very finely ground and the fluffy fibre blown away. The second, the alkali method, consists in heating ground scrap with alkaline solution to destroy the fibre. The third is the acid process. In this the ground scrap is treated with a hot solution of sulphuric acid varying in strength from 15 per cent to 30 per cent, according to the character of the scrap and the fineness to which it has been ground.

As a result the cellulose of the fabric is charred and can be removed by the thorough washing. This washed scrap, free from fabric, is then ready for the depolymerization and softening.

Sulphuric acid is no inconsiderable cost factor in rubber reclaiming and the increase in prices following the outbreak of the war has been keenly felt by the rubber reclaimer. Naturally, an acid substitute has been eagerly sought. In the manufacture of nitric acid by the treatment of sodium nitrate with sulpuric acid, there is produced a secondary product termed nitre cake, and this has proved in many industries the solution of the acid problem.

Nitre cake is a fused salt made up chiefly of sodium acid sulphate. It is readily soluble in hot water and has an average acidity of 32 per cent in terms of sulphuric acid. That is, three pounds of nitre cake approximately equal one pound of 66° acid. The chemical action of a nitre cake solution is practically the same as that of sulphuric acid solution, though it does not have the tendency of acid to char or burn organic matter. Nitre cake is shipped in lump form, either in bulk or barrels. Being a solid, its handling does not present the difficulties of handling acid, especially in carboys.

The substitution of nitre cake for acid in defiberizing rubber scrap is dependent upon the character of the scrap and the degree of fineness to which the scrap is ground or cracked, the strength of the acid solution being governed chiefly by this factor. A hot saturated solution of nitre cake is approximately equal in strength to an 18 per cent acid solution and a cold solution to a 15 per cent solution. Where a stronger solution is necessary it is prepared by dissolving nitre cake in dilute acid. This effects a partial substitution of nitre cake for acid. The method of treatment with a nitre cake solution is the same as with acid and the results the same, except as to the lack of the charring tendency where the nitre cake solution is used.

The grades of scrap treated and the variation in the method of treatment are so wide that it is really necessary for the reclaimer to make an actual trial to determine the applicability of this material to his needs. Certainly, it has merit for it is already being successfully used on a large scale.

Rubber Planting Notes.

COST OF PRODUCING PLANTATION RUBBER IN MALAYA.

FROM a survey of the annual reports of the various rubber companies in the Federated Malay States, it would appear that the average cost of production, f. o. b. steamer, including all expenses except interest charges on investment, was during 1915, approximately 25 cents per pound on well managed plantations in full bearing. Some companies were able to produce their rubber at somewhat lower cost, but quite a number of others reported higher costs which were in many cases due to charging the expense of operating the entire estate, including portions not in bearing, against the output of their productive areas. One company figures its proportionate charges as follows:

	Cents Per Pound.
Collecting and manufacturing	12.00
General administration charges, including superintendence and Singapore offices	5.60
Depreciation	3.40
Miscellaneous	4.00
Total	25.00

With the best grades of rubber ranging, during 1915, from 50 cents to $1 per pound, it is easy to compute the substantial profits of rubber planting in Malaya.

EASTERN PLANTATION PRODUCTION.

A report from United States Consul Harry Campbell, detailed as vice-consul at Singapore, Straits Settlements, states that the production of plantation rubber in the East has increased during the last ten years from practically nothing to 70 per cent of the world's production. He gives the following figures in tons of 2,240 pounds as a verification of his statement, which in some respects differs from some statisticians' figures and estimates:

Year.	East.	Brazil.	Other countries.	Total.
1906	531	36,000	29,500	66,031
1907	1,133	38,000	30,000	69,133
1908	2,010	39,000	24,500	65,510
1909	3,997	42,000	24,000	69,997
1910	7,521	40,800	21,500	69,821
1911	13,973	37,730	23,000	74,703
1912	28,518	42,410	28,000	98,928
1913	47,302	39,370	21,500	108,172
1914	71,959	37,000	12,000	120,959
1915	102,000	36,750	6,000	144,750

Estimating the output for 1915 at an average of 67 cents per pound, which the consul believes is slightly below the actual figure, he places the selling value at $215,000,000, of which $155,000,000 is attributable to the Middle East plantations. As these have a total capitalization of about $282,000,000, his estimate suggests an average profit of about 50 per cent, covering all plantations, both producing and non-producing. He believes this is a fair estimate, because many of the producing companies are reported to be reaping profits of 100 to 200 per cent.

RUBBER CULTIVATION IN HAINAN.

The first exportation of rubber produced in the island of Hainan, China, was shipped in 1915.

Rubber trees were introduced in Hainan in 1910 by two Chinese companies. There are 4,000 in the Lo Hui district, 2,000 of which began to be tapped in April, 1915.

About 400 pounds of rubber was sent to Singapore between June and the end of 1915, which realized about 37 cents per pound. The rubber is said to have been of first quality, but faultily prepared and was therefore sold as second quality. The introduction of machinery will doubtless improve the product.

Since 1910, Chinese interests have planted 12,000 *Hevea* rubber trees in the vicinity of Modoa, Hainan, but these are still young and are not expected to produce for another two years.

SMOKING RUBBER.

Replying to an inquiry in regard to the best wood for producing dense smoke for curing rubber, our South India contemporary "The Planters' Chronicle," says:

Any kind of Indian jungle wood may be used, but it should not be too green as the smoke would then contain too much moisture, with the result that the rubber would dry slowly and be apt to be over-smoked. The best results are obtained with a judicious mixture of dead, dry timber with green wood. *Hevea* logs obtained from thinning out may be used, but they should be first stacked in the sun to dry.

It is not so much the kind of wood which is used, as the type of furnace which produces the best smoke. A comparatively slow rate of combustion should be aimed at. This produces a dense smoke, with a low proportion of fine ash to contaminate the rubber in the smoke-house. The draught should be kept low and the combustion regulated so that the wood glows and smoulders, leaving a high proportion of charcoal at the end instead of white ash.

VALUATION OF RUBBER TREES.

The "Straits Budget," Singapore, Straits Settlements, published the following interesting information regarding the valuation of rubber trees:

"In response to an inquiry from a government department as to the value planters placed upon rubber trees at varying ages, a sub-committee was appointed which drew up a standard valuation as follows:

Age of Tree.	Value in United States Currency. Tapped.	Untapped.	Number of Trees per Acre.
3 months	.....	$0.28	180
6 months	.....	.34	150
9 months	.....	.40	150
1 year	.....	.45	150
2 years	.....	.75	150
3 years	$0.85	1.13	150
4 years	1.32	1.51	150
5 years	2.72	.....	125
6 years	3.47	.....	110
7 years	4.25	.....	100
8 years	4.97	.....	90
9 years	6.02	.....	80
10 years	6.37	.....	80

The standard valuation presumes: (a) that the tree is well grown on good soil; (b) that the tree is healthy; (c) that the tapping has been careful and moderate; (d) that the planting has not been too close, or if originally too close that it has been thinned out; (e) that the expenditure on the estate has been normal; (f) that no pest has attacked the tree; (g) that the price of best rubber is 2*s.* 4*d.* a pound [56 cents].

THINNING OUT RUBBER.

Much has been written on the subject of thinning out rubber, but it appears that no fixed rules have yet been determined.

At a recent meeting of the Committee of Agricultural Experiments at the Peradeniya School of Agriculture, Ceylon, J. S. Patterson submitted some figures showing the result of thinning out on a plantation 20 years old. These figures showed that profitable results appeared to follow the thinning out of a plantation even at this age. The original number of trees was 161 per acre and thinning out during three years brought the number down to 105 trees per acre. The yield had at first dropped from 439 pounds to 400 pounds of dry rubber per acre but had risen to 439 pounds again and appeared to be continuing upon the upward trend.

Questioned as to whether it would be more profitable to begin thinning out at an early date or leave it until the plantation was, say, 20 years old and then thin out, several members of the committee offered remarks, generally agreeing that there were no data upon which to base definite conclusions on this subject. It depended upon so many factors—the original spacing, climate and price of rubber. Nevertheless, the consensus of opinion

was that thinning out should not be delayed too long but should be done early enough to allow the trees ample opportunity to branch.

RUBBER IN SOUTHERN INDIA.

According to a recently issued report, the Pudukad Rubber Co., Limited, has already paid a 5 per cent *interim* dividend and will probably pay a further dividend of 10 per cent for 1915. Last year's rubber crop was 123,481 pounds, which came from 653¼ acres, the total number of trees tapped being 88,155 and the yield per tree 1.56 pounds against 0.81 pounds in 1914. The total area under rubber was 822 acres.

The Kinalur Rubber Co., Limited, which held its first general meeting in Madras May 17, harvested 22,493 pounds of dry rubber last season, as compared with 1,814 pounds in the previous year, and it was stated that the company was likely soon to pay its first dividend. These are remarkable results for plantations that, for the most part, are six years old or less.

BOLIVIAN RUBBER INDUSTRY.

The Bolivian rubber industry has been enjoying some improvement; 1915 exports are estimated to have been over 5,000 tons, as against 4,485 tons in 1914. This improvement was mainly due to higher prices obtained in 1915 for the product, and it is believed that after the war Germany will be a large purchaser of Amazonian rubber, as practically all other rubber comes from lands controlled by the Entente Allies, who, it is believed, will subject the Germans to disadvantages of various kinds.

NEW BOLIVIAN RUBBER CORPORATION.

The Bolivia-Brazil Rubber & Timber Corporation is the name of a company recently incorporated under the laws of the State of Arizona, capitalized with 1,000,000 shares of a par value of $1.00 per share. The announcement of incorporation says that the company has acquired 82,000 acres of rich land along the Madeira and Negro rivers, the latter an affluent of the Abuna, in the Republic of Bolivia. It is stated that this land abounds in rich forests of rubber trees, hard cabinet woods, Tagua nuts (used extensively in making buttons), and other tropical products.

The corporation expects to begin active work on the properties this month with a view to begin tapping the rubber trees early in the coming year. The gathering and preparation of the crude rubber will be carried on under the modern methods. It is planned to supplement gathering wild rubber by establishing large plantations of rubber trees.

CHICLE CONCESSIONS IN VENEZUELA.

The Venezuelan Government has recently granted José Patrocinio Cuellar the exclusive right to export chicle from Venezuela. This concession will be effective during the life of a contract made by the Government in 1912, giving the sole privilege of extracting chicle in Venezuela.

According to United States "Commerce Reports," exports of chicle from Venezuela to the United States have been rapidly increasing, the amount shipped in 1915 being 952,358 pounds, or four times the total shipments of Venezuelan chicle to this country from 1912 to 1914, inclusive.

EXPORTS OF CHICLE FROM BRITISH HONDURAS.

Exports of chicle, or *sapodilla* gum, from British Honduras in 1914 (last statistics published) amount to 3,461,809 pounds, valued at $1,125,519, as compared with 3,163,129 pounds in 1913. Only one-third of this export was the produce of the colony. The United States received almost all of this chicle.

THE SITUATION IN BRAZIL.

By Our Special Correspondent.

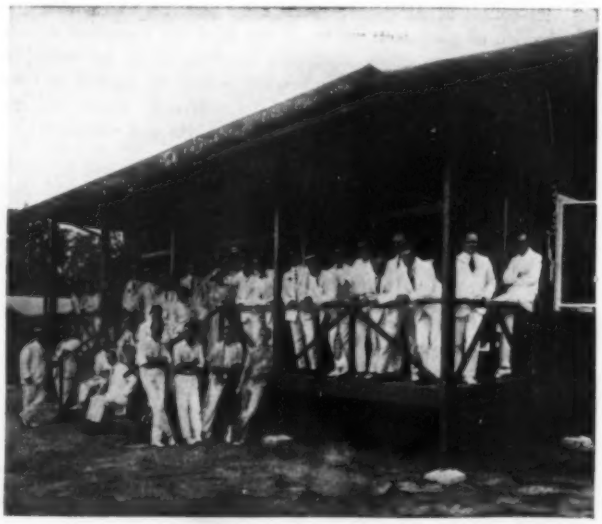
GENERAL conditions in the crude rubber trade here in Brazil are better to-day than they have ever been since the development of plantation competition. The situation has been gradually improving and we are now looking forward to real prosperity.

The decline of exchange has had its effect on the currency prices of our crude rubber and, as a result, those engaged in gathering, preparing and dealing in rubber are prospering, and the position of the Para and Manaos markets is stronger than it ever was before. The depreciation of the pound sterling in this country has, therefore, been of incalculable benefit to our rubber industry.

We are approaching the close of the Amazon 1915-1916 rubber season. The crop shows a considerable increase over that of 1914-1915 and it is expected that the 1916-1917 crop will be larger still, very likely the largest ever harvested in Brazil. Provided exchange does not advance, continued and increased prosperity may be very reasonably expected, and, at the close of the war, we are sure to do wonderful business with Germany.

MANAOS ATHLETIC CLUB INAUGURATED.

The Manaos Athletic Club has recently completed a comfortable club house on its grounds in that city. Naturally, a large number of men connected with the rubber trade are



members, and several may possibly be recognized by a close examination of the picture, which was taken at the inauguration of the club.

GERMAN REQUIREMENTS.

The Germans will need large quantities of crude rubber which they will hardly be disposed or possibly will be unable to obtain from lands under the control of the Entente Allies. It is therefore probable that they will look almost exclusively to South America for their supplies of this commodity.

BRITISH BLACK LISTS.

Many of our large rubber dealers, who have contributed in the past to the greatness of our crude rubber industry, are Germans or at least have German affiliations, and for this reason they have been blacklisted by the British Government, with the result that they are unable to ship their goods in British bottoms

—practically the only ones now available. Further, a number of national concerns have also been "blacklisted" for having assisted the Germans, by allowing them to ship under their names.

At first much resentment resulted from these British measures, but now we are beginning to understand that Great Britain's shipping and commerce are world-wide and interference is therefore world-wide in its effects. At the beginning there was a belief that the British blacklists were aimed against Brazil, for the purpose of favoring British plantation rubber, but this feeling is rapidly vanishing.

RUBBER VALORIZATION.

The press here is again talking of rubber valorization and of the law for the protection of articles made of Brazilian rubber, which it was found impossible to apply.

To revive this question—which has always been fruitless—is really childish. One need only recall the disastrous attempt at valorization which occurred in 1909 when the production of plantations was insignificant as compared with that of Brazil. What would valorization lead to now that the positions have been more than reversed? Last year the plantations of the Orient produced close to 100,000 tons of crude rubber against Brazil's 35,000 tons, and even under the present favorable conditions, and the trade prospects after the war, there is nothing to encourage the belief that our production of crude rubber under the present system will ever approach that of the plantations. Before valorization could prove any measure of success we should create and develop a rubber plantation industry on Eastern lines. We must have vast, easily accessible plantations, in full production and equipped with the most modern machinery, before we can hope to regain our lost leadership.

If we will get to work and profit by the lessons the East has demonstrated, if we will organize real plantations and take proper care of our trees instead of tapping them to death, as is now the practice, then we may be able to get as good, possibly better prices than the East. Such a course would be far more advantageous to the nation than any valorization chimera.

RUBBER PLANTATIONS IN BRITISH GUIANA.

THE official report of the British Guiana Department of Science and Agriculture for the year 1914-15, recently published, states that the total area under rubber cultivation in the colony was 4,962 acres, an increase of 743 acres over the previous year. It consists almost entirely of *Hevea Brasiliensis* and by far the greater proportion of the trees have not yet reached maturity. It is anticipated, however, that tapping operations will be commenced on a fairly extensive scale during 1916.

The rate of growth of the trees in the colony, generally, was more rapid than it was in 1913-14 and considerably greater than in the year 1912-13. During the year 1911-12 the trees were badly afflicted by a prolonged drought.

EXPERIMENTAL TAPPING.

Experimental tapping was continued at Issorora and Onderneeming during the year; tapping was also commenced at Christianburg towards the end of the year.

At Issorora the tapping of 379 trees in one experiment was commenced in November, 1913, a basal V being employed as the tapping system and the trees being tapped every day. In January, 1915, the tapping of the surface of bark (18 inches high and ½ circumference of the tree) marked out for the experiment was completed. Altogether, 714 pounds of dry rubber were collected at an average cost of 16 cents per pound. The trees in this experiment were not adjacent to each other, but were scattered through the older part of the rubber cultivation of the station, and the total number, 379, was found to be rather more than a fair task for one man to tap in a morning. These two factors resulted in the cost of tapping being higher than it would have been had the conditions been more favorable for the experiment. However, this cost of collection for an initial experiment was considered to be quite reasonable.

In February, 1915, another experiment was inaugurated; 300 trees, the number regarded as a fair task for one man to tap in a morning, being tapped each day with a basal V on the opposite half of the tree to that tapped in the previous experiment. Up to the end of the financial year (March 31), 260 pounds of wet rubber had been collected, the equivalent of 130 pounds dry, at a cost of 7 cents a pound.

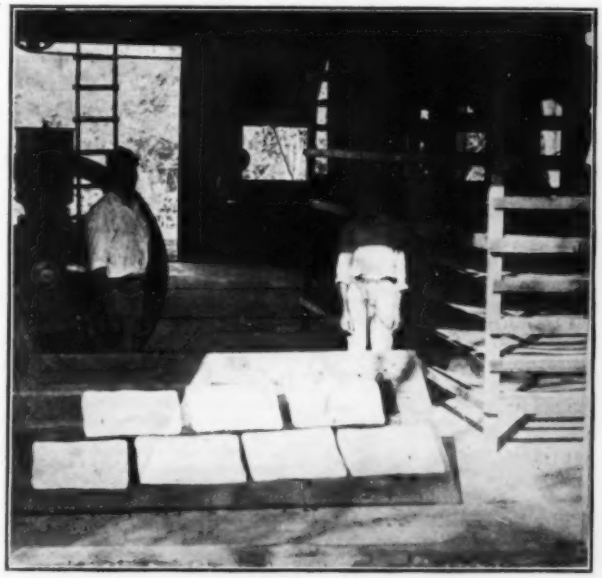
The results of these experiments lead the Department of Science and Agriculture to believe that rubber can be collected at a low cost in British Guiana, if the trees are grown under proper estate conditions.

Tapping experiments at other experimental stations were less extensive than at the Issorora station and had not been sufficiently long in progress to enable any accurate conclusion to be drawn as to the probable cost of collection per pound.

The results obtained at the Issorora experimental station, both in regard to cultivation and tapping of cultivated *Hevea Brasiliensis*, caused much interest among farmers. Towards the close of the year 9,000 *Hevea* seedlings were planted on various grants and general progress was made on the grants of the Consolidated Rubber and Balata Co., during the year, in connection with planting and tapping operations.

BARTICA RUBBER.

Some news and views of the Bartica Agricultural States Plantation in British Guiana were published in the June 1, 1916, issue of THE INDIA RUBBER WORLD. Since that date the first shipment of crude rubber from that plantation has been received in this country. It has been valued at fully equal to first latex crêpe. Now that the 600 acres are coming into bearing, the Bartica brand is likely to be well known. The accompanying view is of one end of the dry-house on this plantation, and shows the first product from five-year-old *Hevea*.



RUBBER EXPORTS FROM TRINIDAD.

According to a recent report of the Agricultural Society of Trinidad, B. W. I., rubber is showing up somewhat better on that island, but is still a disappointing item in the exports of the colony. Very few planters have realized expectations.

Recent Patents Relating to Rubber.

THE UNITED STATES.

ISSUED MAY 2, 1916.

NO. 1,181,133. Tire pressure gage. W. P. Hammond and T. A. Hammond, Passaic, N. J., assignors to A. Schrader's Son, Inc., New York City.

1,181,134. Curling iron having a liquid fuel reservoir and air bulb. G. H. Harper, Oklahoma, Okla.

1,181,243. Tire protector. W. A. Otto, Milwaukee, Wis.

1,181,263. Wheel tire. C. Schragin, Berlin, Germany.

1,181,277. Grip tread for vehicle tires. H. D. Weed, Syracuse, N. Y., assignor to American Chain Co., Inc., Bridgeport, Conn.

1,181,280. Hose coupling. G. J. Winter, assignor to The Republic Hose Coupler Corporation—both of Buffalo, N. Y.

1,181,430. Fountain pen. W. K. Buckles, Rifle, Colo.

1,181,441. Boot or shoe. J. W. Franklin, assignor to National India Rubber Co.—both of Bristol, R. I.

1,181,540. Pneumatic tire. H. D. Peaslee, Fresno, Calif.

1,181,574. Fountain pen comprising a barrel containing a self-expansible rubber sack. S. S. Crocker, Wollaston, Mass.

1,181,646. Waterproof toilet bag. V. E. Davis, New York City.

1,181,670. Rim holding device. J. Kelsey, Detroit, Mich.

1,181,676. Hose coupling. C. H. Lambkin, New York City.

1,181,744. Fountain pen filler control. J. W. Crouser, New York City.

1,181,841. Tire armor. A. J. Chabot, Marlboro, Mass.

1,181,891. Raincoat. H. H. Hulbert, Excelsior, Minn.

1,181,937. Bias lining fabric package. W. C. Stevens, assignor to Firestone Tire & Rubber Co.—both of Akron, Ohio.

ISSUED JUNE 20, 1916.

1,187,489. Heel protector for rubber shoes. C. Besse, Watertown, Mass.

1,187,539. Tire valve tightener. C. D Miller, St. Joseph, Mo.

1,187,553. Hose connection. J. A. Riordan, Rochester, assignor of thirty-five one-hundredths to N. G. Riordan, Salamanca—both in New York.

1,187,624. Auto tire. E. A. Illig, assignor to E. F. Shugart—both of Erie, Pa.

1,187,637. Pneumatic tire. A. Malsin, New York City.

1,187,654. Safety tire valve. E. J. Ryan, assignor of one-half to P. M. Welsh and one-twentieth to M. H. Darby—all of Long Beach, Calif.

1,187,666. Antiskid horseshoe calk. V. Slaninka, Swanton, assignor of one-half to H. Dietz, Rossford—both in Ohio.

1,187,820. Demountable rim. I. B Dace, Rushville, Ill.

1,187,838. Musical rubber ball. R. D. Hughes, assignor to W. J. Almond, F. H. Almond and C. H. Almond, Jr.—all of Lynchburg, Va.

1,188,034. Antiskid tread. E. H. Bingham, San Francisco, Calif.

1,188,062. Flat section pneumatic tire. J. R. Gammeter, Akron, Ohio, assignor to The B. F. Goodrich Co., New York City.

1,188,180. Surgical tip. C. E. Kells, New Orleans, La.

1,188,195. Tire and reliner. E. F. Morse, assignor of fifteen thirty-seconds to W. F. Knap—both of Des Moines, Iowa, and nine thirty-seconds to W. G. Park, Galveston, Texas.

1,188,200. Demountable rim. O. A. Parker, Cleveland, Ohio.

1,188,233. Pneumatic automobile tire body with a plurality of spaced closed cells containing air. J. C. Anderson, Washington, D. C.

1,188,271. Self-filling fountain pen. J. Harris, New York City.

1,188,276. Inflation device for multiple chambered tires. W. L. Ireland, Grand Ledge, Mich.

1,188,311. Electrically illuminated fountain pen. H. Pendleton, assignor of one-half to M. A. Spaulding—both of Kokomo, Ind.

1,188,347. Friction plug rubber heel. F. J. Gleason, Walpole, assignor to Standard Woven Fabric Co., Framingham—both in Massachusetts.

1,188,348. Rubber heel. F. J. Gleason, Walpole, assignor to Standard Woven Fabric Co., Framingham—both in Massachusetts.

ISSUED JUNE 27, 1916.

1,188,394. Fountain pen. M. Bernstein, New York City.

1,188,478. Apparatus for enteric lavage. L. C. Pair, Dallas, Texas.

1,188,588. Brake lining and similar material. E. E. Waite, assignor to Standard Woven Fabric Co.—both of Framingham, Mass.

1,188,598. Vehicle wheel with pneumatic cushions. A. J. Wolff, Hartford, Conn.

1,188,668. Soap carrier and massage device. G. A. Madison, St. Paul, Minn.

1,188,694. Inner tube for pneumatic tires. A. L. Stanford, Chicago, Ill., assignor of one-half to R. B. Gillette, Eau Claire, Wis.

1,188,701. Automobile tire. W. H. Strouse, Oskaloosa, Iowa.

1,188,739. Pneumatic tire. O. C. Davis, Brockton, Mass.

1,188,823. Tooth-brush attachment. T. R. Plank, Los Angeles, Calif.

1,188,904. Bottle protector of rubber. J. E. Gosgriff, New York City.

1,188,998. Tire plug. L. V. Rood, Marietta, Ohio.

1,189,091. Cushion tip for the keys of typewriters and like machines. E. H. Gemmill, Akron, Ohio, assignor to Thorp & Martin Typewriter Co., Boston, Mass.

ISSUED JULY 4, 1916.

1,189,223. Vehicle wheel including a pneumatic tire. L. Albrecht, New York City.

1,189,404. Clamp for hose and the like. F. J. Stulp, Muskegon, Mich.

1,189,408. Rubberized cloth for billiard tables. J. Turner, Dorchester, Mass.

1,189,421. Means for locking demountable tire rims. G. G. Bayne and A. W. Knutson, Quincy, Ill.; Knutson assignor to Bayne.

1,189,424. Tire tool. F. H. Burrill, assignor to The Burrill Tire Tool Co.—both of Concord Junction, Mass.

1,189,446. Demountable rim. C. C. Harbridge, assignor to Detroit Demountable Rim Co.—both of Detroit, Mich.

1,189,472. Rubber heel with metal wear plate. J. Opperud, Madison, S. D.

1,189,485. Automobile tire. J. C. Reifsnider, Seattle, Wash.

1,189,505. Tooth brush with liquid containing bulb. L. C. Stockton, Denver, Colo.

1,189,511. Pneumatic tire. C. E. Vawter, Blacksburg, Va.

1,189,569. Automobile tire tread. W. H. Henderson, Omaha, Nebr.

1,189,586. Fountain syringe. J. B. A. LaJeunesse, Alameda, Calif.

1,189,589. Nursing brassiere. L. Lawrence, Vancouver, British Columbia, Canada.

1,189,654. Pneumatic tire. B. Barrow, Barrows Store, Va.

1,189,730. Tire. M. C. Overman, New York City.

1,189,788. Resilient tire. T. L. Carbone, Charlottenburg, Germany.

1,189,789. Resilient tire. T. L. Carbone, Charlottenburg, Germany.

1,189,845. Tire. S. Liolios, Charleston, Mo.

1,189,857. Puncture proof automobile tire supporter. C. O. Myers and H. T. Maring, Gettysburg, Pa.

1,189,859. Rubber heel. F. Nerger, Chicago, Ill.

1,189,923. Tire tool. R. W. Damaron, Jackson, Mich.

1,189,937. Eraser. B. B. Goldsmith, New York City.

1,189,989. Full-on attachment for overshoes. L. R. Moore, San Rafael, Calif.

1,190,017. Hair-drying device comprising a bulb of rubber. G. L. Scheel, Chicago, Ill.

1,190,065. Pneumatic tire sleeve or patch. R. Yost, Tyrone, N. Y.

1,190,068. Hose coupling. R. J. Abbott, Washington, D. C.

1,190,118. Wheel rim. W. E. Copithorn, Natick, Mass.

1,190,144. Pneumatic tire. M. A. Gibbons, Des Moines, Iowa.

1,190,179. Bath mat. E. L. Livingston, West Orange, N. J.

1,190,228. Fountain brush. J. Barlow Fesler, assignor to Fesler Sales Co.—both of New York City.

ISSUED JULY 11, 1916.

1,190,266. Bath mat. E. R. Crooker, Los Angeles, Calif.

1,190,474. Pneumatic tire and process of making. J. H. Seiberling, Jonesboro, Ind.

1,190,497. Rubber stamp type holder. M. L. Willard, assignor to Superior Type Co.—both of Chicago, Ill.

1,190,602. Brassiere. S. Sorkin, New York City.

1,190,744. Inner tubes for pneumatic tires. F. Fenton, Akron, Ohio.

1,190,781. Sponge rubber hand grip for steering wheels. D. F. Maher, Watsonville, Calif.

1,190,790. Well packer having a rubber body. F. J. Moser, Kane, Pa.

1,190,866. Tire valve attachment. H. F. Crawford, Brockton, Mass.

1,190,867. Fountain pen provided with reservoirs for different colored inks. H. C. Crosby, New York City.

1,191,065. Demountable rim. W. E. Copithorn, Natick, Mass.

1,191,081. Demountable rim. J. S. Johnston, Utica, N. Y.

1,191,101. Detachable rim clamp. D. E. Agnew, assignor of one-half to to H. F. Sullivan—both of Portland, Oreg.

THE UNITED KINGDOM.

PATENT SPECIFICATIONS PUBLISHED.

In order to give the public the advantage of having abridgments of specifications up to date while retaining their numerical sequence, applications for patents made subsequent to 1915 are given new numbers when their complete specifications are accepted, or become open to public inspection before acceptance. The new numbers start with No. 100,001 (without any indication of date), and supersede the original application numbers in all proceedings after acceptance of the complete specifications.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JUNE 7, 1916.]

2,449 (1915). Hose pipe and like clamps. F. Neppach, 63 Karlstrasse, Cannstatt, Stuttgart, Germany.

2,451 (1915). Rubber hose coupling. R. Barnfather, 55 Margravine Gardens, Hammersmith, London.

2,489 (1915). Suction grip for portable electric lamps. H. J. C. Forrester, 75 New street, Birmingham.

2,510 (1915). Corsets comprising elastic sections. R. Charnley, 8 Chatnam street, Piccadilly, Manchester.

2,512 (1915). Gramophone with rubber bulb and tubing. G. T. Waite, 172 High street, West Bromwich, near Birmingham.

[Chemical Patents will be found on pages 596-597; Machinery and Process Patents on pages 600-603.]

2,606 (1915). Rubber covered roller. J. Muskett, 42 Delamere avenue, Swinton Park Road, Pendleton, Manchester.

2,638 (1915). Collapsible hinged segment tire rim for aeroplanes, etc. Dunlop Rubber Co., 14 Regent street, Westminster, and C. MacBeth. Manor Mills, Salford street, Aston Cross, Birmingham.

2,675 (1915). Detachable rim for vehicle wheels. A. H. Greenfield, 92 Earl's Court Road, London.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JUNE 14, 1916.]

2,739 (1915). Rubber cement in hat manufacture. C. Clermont, 66 Hyde Road, Denton, near Manchester.

2,753 (1915). Stoppers for hot-water bottles and method of insertion. T. T. Brown, 2 Carson Road, Levenshulme, Manchester.

2,778 (1915). Cushion wheel tire. J. F. Vander Velde, 12d Bezuidenhout street. Troyeville, Johannesburg, and J. Hosking, 34-a Harpur avenue, Benoni, Transvaal.

2,776 (1915). Sock suspender. C. A. Hamlin, 16 Hobson Buildings, Shortland street, Auckland, New Zealand.

2,946 (1915). Vulcanite reflectors. M. Wiskott, 3 Flurstrasse, Breslau, Germany.

2,952 (1915). Rubber wheel tire. J. Cairns, 27 Payne avenue, Hove, Brighton.

2,959 (1915). Reservoir pens. E. M. Wade, 65 Cavendish Drive, Rock Ferry, Cheshire.

3,015 (1915). Tent pole comprising a rubber spring. F. Schultz, 12b Voorhout street, Troyeville, Johannesburg, South Africa.

3,029 (1915). Inflatable life saving jacket. J. C. Steer, 9 Evans Terrace, Swansea.

3,103 (1915). Finger-stall of chamois with an attached elastic band for holding it in position. I. L. Williamson, 145 Addycombe Terrace, Heaton, Newcastle-on-Tyne.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JUNE 21, 1916.]

3.138 (1915). Toy operated by rubber bands. C. T. Eaton, 84 Eaton Terrace, London.

3,171 (1915). Cushion tire. T. Whitehead, Bela Grove, Blackpool, Lancashire.

3,213 (1915). Device for anchoring or attaching electric cables having an external rubber sheathing. A. E. Foster, 86 Maryon Road, Charlton, Kent.

3,235 (1915). Non-skid pad for wheel tires. A. E. Walkden, 46 Trafalgar Road, Egremont, Cheshire.

3,251 (1915). Rubber packing in siphon heads. J. R. Trigwell, "Rayleigh," Bishop's Park Road, Norbury, Surrey.

3,326 (1915). Galvanic battery comprising a rubber strip. W. S. Naylor, Clifton Junction, Manchester.

*3,441 (1915). Inflatable life buoy the shape of a sailor's collar and adapted to be secured and concealed by the collar of a garment. W. G. Brokaw, Highpoint, North Carolina.

*100,335 (1916). Device intended to prevent the heel of an overshoe from slipping. F. W. Ostrom, 78 Court street, Newark, New Jersey.

[ABSTRACTED IN THE ILLUSTRATED OFFICIAL JOURNAL, JUNE 28, 1916.]

3,568 (1915). Rehabilitating old tires, employing layers of rubber and rubber proofed asbestos. E. C. Langton, 238 Sebert Road, Forrest Gate, Essex.

3,623 (1915). Jackets and covers for tires. D. R. Shewan, 1541 22nd Avenue East, Vancouver, British Columbia, Canada.

3,625 (1915). Kit-bags and sleeping valises. A. M. Bellingham, 11th (Service) Battalion, Middlesex Regiment, Aldershot.

3,754 (1915). Tire attachments to rims. R. S. Stephen, 4 Gillespie Crescent, Edinburgh.

3,788 (1915). Raising sunken bodies by means of inflatable air bags. C. Daghetto, 74 Corso Vittorio Emanuele, Turin, Italy.

100,360. Rubber glove for use in teaching writing. A. Usterud, Boleveien, Skien, Norway.

100,362. Pneumatic tire cover. E. L. De Bayo, 16 Alameda Mazarredo, Bilbao, Spain.

100,371. Tire tool. D. R. Lewis, Trebanos, near Pontardawe, Swansea Valley; F. J. Morgan, 30 Wind street, Swansea, and D. H. Thomas, 56 Waun Road, Morristown—all in Glamorganshire, and A. D. Berk, 1 Fenchurch avenue, London.

*100,381. Cushion tire. J. Milne, 30 Church street, New York City.

THE FRENCH REPUBLIC.

PATENTS ISSUED (With Dates of Application).

479,299 (July 17, 1915). Improved suspenders. Société de Caoutchouc Manufacturé.

479,300 (July 17, 1915). Improvements in making suspenders. Société de Caoutchouc Manufacturé.

479,208 (July 19, 1915). Improved wheel for automobiles. A. C. Dunham.

479,340 (March 26, 1915). Improvements in elastic wheels. B. J. Mattingly.

479,407 (July 28, 1915). Detachable rim. E. Duboeuf.

479,502. (August 13, 1915). New rubber glove and method for its manufacture. Société de Caoutchouc Manufacturé.

479,504 (August 13, 1915). Pneumatic tire. E. V. Roberts.

479,535 (August 14, 1915). Elastic tire for wheels. J. P. Murray and C. F. Wood.

479,543 (August 15, 1915). Process for manufacturing rubber agglomerates. J. Daura Mundi.

*Denotes Patents for American Inventions.

479,550 (August 18, 1915). Rubber overshoe. A. Johnston and The North British Rubber Co., Limited.

479,604 (August 27, 1915). Detachable, interchangeable wheel for automobiles and similar vehicles. W. Baker, J. S. Foley, and Baker Rim Co.

NEW ZEALAND.

ISSUED MAY 11, 1916.

*35,790. Talking machine sound box of rubber. A. D. Jones, 46 Sibley Building, 1214 Filbert street, Philadelphia, Pa.

36,664. Tire filler. J. Flint and G. Bolton, Main street, Katoomba, N. S. W., and W. A. McLauchlan, 44 Victoria Road, Marrickville.

37,099. Tire clasp. G. H. Broughton, 7 Spruce Court, Toronto, Canada.

37,233. Stayette. M. J. Taylor, Rickard avenue, Bondi, Sydney, N. S. W.

36,293. Milking machine teat cup. G. W. Gane, Normanby, and J. Hopkirk, Hawera—both in New Zealand.

37,085. Tire repair outfit box and press. A. J. Bert, Elizabeth Bay Road, Sydney, assignee of W. M. Holliday, St. Thomas Rectory, Mulgoa Road, Penrith—both in New South Wales.

*37,344. Wheel pressed metal. Simmons Wheel Co., Room 718 State Bank and Trust Building, assignees of O. G. Simmons, 3120 N. Flores street—both of San Antonio, Texas.

TRADE-MARKS.

THE UNITED STATES.

92,483. An illustration of a section of a tire with the ward IMPERATOR across the center—rubber automobile tires. Sporub Tire Co., Chicago, Ill.

93,311. The word SWAGO—Asbestos, rubber, and composition packing. Neptune Packing and Rubber Co., New York City.

90,566. The word OXWELD—Combined rubber and fabric hose. Oxweld Acetylene Co., Chicago, Ill.

93,365. The words PUSSY FOOT—boots and shoes of leather, rubber, etc. The Hurlbut Co., Limited, Preston, Ontario, Canada.

95,423. The word SILVAREIGN—raincoats and capes. C. Kenyon Co., Brooklyn, N. Y.

84,585. An illustration with the words PHARIS PACKARD—pneumatic tires and inner tubes. The Pharis Tire & Rubber Co., Newark, Ohio.

85,465. The words NON LEAKABLE, NO LOST TIME, NO LUGGING, NO LIES, written one above the other and on top an illustration of a tire with the letters *F A B* in the center—cement for stopping leaks in punctured pneumatic tires. F. A. Buono, Hackensack, N. J.

92,606. Illustration of a tire with blue bands or stripes positioned circumferentially and on opposite sides of the center-line of the tread portion—elastic vehicle tires. The Goodyear Tire & Rubber Co., Akron, Ohio.

94,411. The word VICTOR—belt dressing and balata cement. Victor Balata & Textile Belting Co., Easton, Pa., and Brooklyn, N. Y.

94,432. The word RIMCO—rubber tubes and rubber tires. Rubber Insulated Metals Corporation, Richmond, Va., and Plainfield, N. J.

94,695. The word NAUGAHYDE—carriage cloth. American Rubber Co., Boston, Mass.

94,696. The word DRYBAK—carriage cloth. American Rubber Co., Boston, Mass.

94,857. The word MULTICO—friction tape. Standard Woven Fabric Co., Framingham, Mass.

94,858. The word STANWOVE—friction tape. Standard Woven Fabric Co., Framingham, Mass.

94,737. The word WALKMORE—heels and soles of boots and shoes. Fellsway Rubber Co., Medford, Mass.

88,634. The words RUB-STEEL—rubber valves. Voorhees Rubber Manufacturing Co., Jersey City, N. J.

94,185. The word LILY—rubber gloves for general use, brassieres, rubber bathing caps, and infants' bibs. Brooklyn Shield & Rubber Co., Brooklyn, N. Y.

94,567. Two concentric circles with the word ENDUROID—a substitute for leather. Endurance Tire & Rubber Co., New Brunswick, N. J.

94,789. The word NORBY—rubber hose reinforced with fabric. Eureka Fire Hose Manufacturing Co., New York City.

95,673. The word NEMO—abdominal belts made of rubber, cloth, and combinations of rubber and cloth. Kops Bros., New York City.

95,845. Pictorial representations, in the center the words HAPPY HIKER—boots and shoes made of leather or canvas with leather, felt, or rubber soles. George R. Jones Co., Manchester, N. H.

THE FRENCH REPUBLIC.

9,901. The name LE 75—rubber goods, shoe heels, etc. Michel Degueurce, Bron.

9,902. The name LE 105—*Same.*

*23,869. The word GARLOCK inside a lozenge—packings. Garlock Packing Co., Palmyra, N. Y.

*23,931. The word WALOHN—dry goods and corset stays covered with vulcanized rubber. Walohn Manufacturing Co., New York, N. Y.

24,350. A rhinoceros with the word DERMATINE—rubber goods. Dermatine Co., Limited, Camberwell, London, S.E., England.

160,665. The word ASBESTOID—substitute for wood. Camille Tiébaut, Paris.

160,666. The word PAPEROID— *Same.*
160,667. The word CARTEROID— *Same.*
160,668. The word CALEROID— *Same.*
160,671. The name L'ABBY—liquid and paste containing rubber for cold proofing fabrics and leather. Gustave Pary, Paris.
160,695. The name LE POILU—pneumatic tire casings and tubes, and other bicycle accessories. Ernest Veluard, Paris.
160,918. The name LA VICTORIEUSE—garters, suspenders, braces, belts, tobacco pouches, bibs, bed cloths, dress shields, erasers, toys, waterproof garments, cushions, elastic fabrics, finger cots, proofed fabrics, all of rubber or containing rubber. Société de Caoutchouc Manufacturé, Paris.
160,919. The name LE VICTORIEUX— *Same.*
160,920. The name LE COQ GLORIEUX— *Same.*
160,921. The name TOMMY— *Same.*
160,922. The name MARNE— *Same.*
160,923. The name JOFFRE— *Same.*
160,924. The name JOFFRINE— *Same.*
160,925. The name JOFFRETTE— *Same.*
160,926. The name JOFFRINETTE— *Same.*
160,927. The name FLEUR DE GLOIRE— *Same.*
160,928. The name MARÉCHAL JOFFRE— *Same.*
160,929. The name SOUVENIR D'ALSACE—*Same.*
17,059. The word ZENITH—erasers. Jules Vru, Marseilles.
161,130. The word ERIN—erasers. G. Michaud, Quantin & Cie., Paris.
161,131. The word ECRITOIRE—erasers. Desvernay & Cie., Paris.
161,133. The name No. 300—erasers. Fargard & Leuba, Paris.

DESIGNS.

THE UNITED STATES.

48,959. Garter. L. S. Agerton, Nashville, Tenn.
48,965. Clock-casing. F. Boyle, assignor to United States Rubber Co.—both of New York City.
48,972. Comb. G. D. Harper, Minneapolis, Minn.
48,981. Tire tread. W. D. McNaull, assignor to The McNaull Auto Tire Co.—both of Toledo, Ohio.
48,991. Automobile tire. W. A. Robbins, Glen Ridge, N. J.
49,211. Resilient tire. H. H. Hewitt, Buffalo, N. Y.
49,213. Rubber tire. V. P. Jackson, assignor to Globe Rubber Tire Manufacturing Co., Inc.—both of Trenton, N. J.
49,283. Rubber tire. M. W. Roe, assignor to The McGraw Tire & Rubber Co.—both of East Palentine, Ohio.
49,296. Tire tread. O. Braunwarth, New York City.

HOW SHOULD RUBBER BE SOLD?

UNDER this title our English contemporary, "The India Rubber Journal," publishes a very interesting and timely article by W. F. de Bois Maclaren, the well-known rubber plantation agent.

After reviewing the situation of the crude rubber market in England and on the continent of Europe before the war, and comparing it with present conditions, Mr. Maclaren proposes forward sales contracts, on a sliding scale plan, as a means of protecting producers from too low returns for their rubber.

Prior to the war most of the crude rubber marketed in England was sold at public auctions, where, according to Mr. Maclaren, it was recklessly sacrificed at the rate of as many lots per minute as possible, for whatever bids rubber dealers chose to offer. Rarely was there any strong competition to secure lots.

On the Continent, sales were chiefly made by sealed tenders, the highest bidder always being declared the purchaser. This means of sale was always strongly opposed by rubber brokers in England, who maintained that the public auction was best in the interests of the owners as well as most convenient for buyers. To this system Mr. Maclaren lays the fact that first latex rubber was sold as low as 1*s.* 10*d.* [44 cents] per pound in London in 1913.

When the war came, public auctions had to be abandoned and sales by negotiation through brokers took their place. These sales have been recognized to be so much more satisfactory in their results that it is not likely that the auctions will ever again be revived.

Mr. Maclaren holds that the rubber plantation industry is, however, still too largely at the mercy of dealers and speculators in rubber, which fact, he claims, is to a large extent concealed by the extraordinary demand for rubber in the United States and the increased consumption in England. Given a period of temporarily restricted trade, together with large and increasing arrivals of crude rubber, the same conditions would be repeated, unfavorable to the rubber planters.

SALES BY FORWARD CONTRACT.

As a remedy against this, Mr. Maclaren proposes the development and popularizing of the system of selling forward. He argues that:

Sales by forward contract are not new in the crude rubber trade, and they have done much for the rubber plantation industry. The chief benefit derived from such forward sales is that the amount of unsold rubber arriving on the market at any one time is restricted, and thus the demand for what is left is stronger than it otherwise would be. The larger the unsold tonnage on the market at any time, the greater the opportunity of the dealers and speculators to make large profits at the expense of the producers by breaking down the price.

RISKS OF FORWARD SALES.

Directors and commercial agents of rubber companies are not always ready sellers. Quite a large number of rubber companies sell no rubber forward and many others sell only the most meager portions of their total output. Yet these companies derive benefits from the sales made by the more public-spirited companies, and on occasion are able to boast that they have obtained a higher average price for their crops. The rubber market is so speculative that no one, however intelligent or well informed, can forecast its course with certainty. A forward sale, while insuring a certain profit on the portion of the crop sold, may be the means of depriving the company of a further considerable profit which it would otherwise have obtained.

Another aspect of the case is that it is sometimes the buyer forward who suffers severely.

PROPOSES SLIDING SCALE.

To the end that neither the seller nor the buyer be heavily penalized as the result of having entered into a forward sale contract, Mr. Maclaren proposes the adoption of a sliding scale in all such contracts. He takes a suppositious case as example:

A enters into a contract to sell forward to *B* three tons of crude rubber per month during a period extending from January to December, 1917, at 3*s.* 2*d.* per pound. In this supposed case one of two things is likely to happen. The market price may rise considerably and the seller regret the sale or, on the other hand, it might fall considerably and the purchaser suffer heavily financially on account of his purchase. In either case the result is more or less bad from the point of view of those interested in maintaining sound market conditions. With a sliding scale clause, such as is frequently inserted in forward sale contracts for very large amounts in the base metal trade, this would not have happened.

The working out of this suppositious contract the writer explains as follows:

Let it be imagined that during 1917 an average price of 4*s.* 2*d.* instead of 3*s.* 2*d.* ruled for first grade latex rubber. In this case, instead of suffering an apparent loss of one shilling per pound on 36 tons sold forward, of which amount the market was relieved, half of the rise would be paid to the seller who had assisted in bringing about the improved market condition. The seller would thus get an average price of 3*s.* 8*d.* per pound. . . . Or, on the other hand, if there was a heavy fall in the price of rubber and the average for the year was 2*s.* 2*d.* instead of 3*s.* 2*d.*—the rate at which the forward contract was made—the loss would be shared. Instead of 3*s.* 2*d.*, the seller would receive an average price of 2*s.* 8*d.*, which would be 6*d.* more per pound than the average price for the year.

Mr. Maclaren argues that both the buyers and the sellers would run far smaller risks under such contracts than they do under present conditions, and consequently would be disposed to transact the bulk of their business on these safe, conservative lines. Further, the reduced quantities of spot rubber that would be on sale at any period would prevent dealers and speculators from making profits that are detrimental to the crude rubber producer. The result would be more stable market conditions and probably generally higher prices.

Review of the Crude Rubber Market.

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NEW YORK.

IT Can be said in general that the market conditions which have prevailed during July were decidedly quiet. There has been, however, a fair demand and considerable inquiry with the principal interest centered in plantation futures for delivery during the coming year. Spot plantations have been scarce with prices ruling higher than quotations on forward positions for next year. The arrival of about 800 tons at San Francisco, last month, is the record for that port; however, Seattle is still the principal port of entry for eastern shipments via the Pacific coast.

Upriver fine was still high as compared to First latex and has maintained a generally firm position throughout the month, but an easier tendency was noticed during the closing week. Supplies of this particular grade are scarce, but it is too early for the market to feel the effects of the new crop that is not due to arrive until November. The other Para grades were fairly plentiful at normal prices.

During the last week of the month the cables from London announced a sharp advance and the New York Market responded accordingly by promptly advancing. This was primarily due to the reports of heavy buying in the eastern markets and rumors of large orders being placed in London for Russian account. This movement has the appearance of only a temporary flurry, and that it will subside as soon as the dealers have covered their requirements, is freely predicted.

The market was fairly steady with firm prices early in the month, but the heavy arrivals in London reported later caused prices to break sharply. On July 5, First latex spot and July-December were quoted 58 cents. Ribbed was 57 cents for both spot and futures while Upriver fine sold for 68 cents for spot and July-December deliveries. Prices for plantations continued unchanged, with minor fluctuations, Smoked sheet ribbed holding about a cent lower than First latex until the middle of the month when only a difference of one half cent was noted. The advance occurred on July 26, when First latex spot was quoted 59½ cents, buyers 58½ to 59 cents and Smoked sheet ribbed spot was 59½ cents. Upriver fine spot was scarce at 67 cents, and forward positions were held at 65 cents. The medium grades were normal, with the exception of Islands fine spot that was quoted 56½ cents and Islands coarse spot at 26½ cents. An easier tendency was noticed in all Para grades during the last week of the month.

The arrivals at New York, July 1-19, were approximately 3,530 tons compared to 5,635 tons for about the same period in June. They were as follows: Plantations from London and Liverpool, 1,300 tons; Colombo, 300 tons; Singapore, 80 tons; Seattle 760 tons; Para rubber from Brazil, 800 tons; from Europe, 80 tons; Centrals, 50 tons; Guayule, 58 tons; African, 17 tons and Manicoba, 85 tons.

LONDON.

The London market has been generally quiet and uneventful, with little to record other than the possible causes of the sharp advance that occurred late in the month, which has been already mentioned. On July 1, First latex spot was 56 cents and Smoked sheet ribbed spot, 55.5 cents. These prices continued during the month with slight variations until July 28, when First latex spot was quoted 55 cents and ribbed spot 54.5 cents. London crude rubber arrivals during June were approximately 4,000 tons. Liverpool arrivals for the same period were 1,000 tons.

SINGAPORE.

There were 967 tons sold at the four auctions held on July 7, 13, 20 and 27. Crêpe brought an average of 53.2 cents and Smoked sheet, 52.1 cents. Good demand and an active market were reported at the last auction.

NEW YORK QUOTATIONS.

Following are the quotations at New York one year ago, one month ago, and July 29, the current date:

	August 1, 1915.	July 1, 1916.	July 29, 1916.
PARA.			
Upriver, fine, new	60 @60½	65 @66	66½@
Upriver, fine, old	61 @63	.....	.....
Islands, fine, new	51½@52	57 @	59 @
Islands, fine, old	55 @56	.....	.....
Upriver, coarse, new	44 @	41½@42	40¾@
Upriver, coarse, old	.....	.....	.....
Islands, coarse, new	28 @	26 @	28½@
Islands, coarse, old	.....	.....	.....
Cametá	31 @	32 @	32 @
Caucho, ball, upper	45½@	42 @	41 @
Caucho, ball, lower	43 @	40 @	36 @
PLANTATION.			
First latex crêpe { Spot / Afloat	63 @ / 62½@	Spot 60 @ / Futures 60 @	58 @ / 58 @
Amber crêpe, light	.....	{ Spot 58½@ / Futures 58¼@	56 @ / 56 @
Brown crêpe, clean	.....	{ Spot 56½@ / Futures 56½@	54 @ / 52½@
Smoked sheet, ribbed { Spot / Afloat	62 @ / 61½@	Spot 59 @ / Futures 59 @	57½@ / 57 @
Fine sheets and biscuits, unsmoked	60 @	.....	.....
CENTRALS.			
Corinto	43½@	40 @	41 @
Esmeralda, sausage	42½@	40 @	40 @
Nicaragua, scrap	42 @	40 @	39 @
Mexican plantation, sheet	.....	.....	.....
Mexican, scrap	42½@	39 @	.....
Mexican, slab	.....	32 @	28 @30
Manicoba	37 @38	42½@	42½@
Mangabeira, sheet	38 @	40 @	40 @
Guayule	34 @35	36 @	35 @
Balata, sheet	55 @56	74 @	72½@
Balta, block	47 @48	55 @	41 @
AFRICAN.			
Lopori, ball, prime	53 @54	58 @	53 @
Lopori, strip, prime	.....	.....	.....
Upper Congo, ball, red	.....	54 @55	52 @
Rio Nunez Niggers	55 @	54 @	53 @
Conakry Niggers	53 @	50 @52	53 @
Massai, red	52 @53	56 @	51 @
Soudan, Niggers	.....	48 @52	.....
Cameroon, ball, soft	.....	44 @51	.....
Cameroon, ball, hard	.....	.....	.....
Benguela, No. 1	33 @	42 @	36½@
Benguela, No. 2	.....	35 @	35½@
Accra, flake	22½@	28 @	33 @
EAST INDIAN.			
Assam, block	44 @48	.....	40 @
Pontianak	7½@	8¼@	8 @
Gutta Siak	12½@14	14¼@	18 @19
Gutta red Niger	.....	23 @	24 @25
Borneo III	.....	18 @20	.....
Gutta Percha	50 @1.50	1.50 @2.50	1.50 @2.50

MARKET CABLE SERVICE FROM SINGAPORE.

The following reports of the weekly auctions held at Singapore have been cabled by The Waterhouse Co., Limited:

Date.	Crêpe. Price per lb.	Smoked Sheet. Price per lb.	Pounds Sold.	Market.
July 7....*cents*	52.2	51.8	739,200	Active, same prices.
July 13.....	54.8	53.1	560,000	Duller.
July 20.....	53.4	51.0	636,160	Firmer, more inquiry.
July 27.....	52.7	52.7	846,720	Active, good demand.

COMPARATIVE NEW YORK PRICES FOR JULY.

The demand for Commercial paper still continues quite good, though not as large this month as previously, and the best rubber names are now quoted about 4½@4¾ per cent, and those not so well known 5@5½ per cent.

	1916.*	1915.	1914.
Upriver, fine	$0.65@0.68	$0.59@0.63	$0.68@0.75
Upriver, coarse	.41@ .42	.44@ .47	.40@ .42
Islands, fine	.58@ .59	.52@ .54	.57@ .60
Islands, coarse	.26@ .28	.28@ .30	.27@ .30
Cametá	.33@ .34	.31@ .32	.30@ .34

*Figured only to July 26.

SINGAPORE.

GUTHRIE & CO., LIMITED, report [June 16, 1916]:

At the continuation of the auction today demand was slow and values suffered a further decline. The top price paid was $128, one parcel of standard crêpe fetching this figure. Standard sheet sold up to $126.

All other grades were from $2 to $5 lower than yesterday's levels.

Of the quantity cataloged some 300 tons changed hands.

The following was the course of values:

	In Singapore per picul.*	Sterling equivalent per pound in London.	Equivalent per pound in cents.†
Sheet, fine ribbed smoked...	$122@129	2/ 5⅛@2/ 6¾	59.04@62.08
Sheet, good ribbed smoked...	117@123	2/ 4⅛@2/ 5⅜	57.01@59.54
Sheet, plain smoked	118@123	2/ 4¼@2/ 5⅜	57.27@59.54
Sheet, ribbed unsmoked	117@124	2/ 4⅛@2/ 5½	57.01@59.80
Sheet, plain unsmoked	115@127	2/ 3⅝@2/ 6⅛	56.00@61.06
Crêpe, fine pale	128@130	2/ 6⅜@2/ 6¾	61.57@62.33
Crêpe, good pale	122@128	2/ 5⅛@2/ 6⅛	59.04@61.57
Crêpe, fine brown	120@125	2/ 4¾@2/ 5¾	58.28@60.31
Crêpe, good brown	110@119	2/ 2⅜@2/ 4½	53.46@57.77
Crêpe, dark	90@114	1/10⅜@2/ 2½	45.35@53.72
Crêpe, bark	70@ 94	1/ 6¼@1/11⅛	36.99@47.13
Scrap, virgin	83@101	1/ 9 @2/ 0¾	42.57@50.17
Scrap, pressed	55@ 88	1/ 3 @1/10	30.41@44.60
Scrap, loose	53@ 85	1/ 2⅞@1/ 9¾	30.15@43.33

*Picul = 133⅓ pounds.

†Figured at standard rate of exchange, 1s. = 24.3 cents.

Quoted in S. S. dollars = 2/4 [56.7 cents].

CRUDE RUBBER ARRIVALS AT THE PORT OF NEW YORK.

[The Figures Indicate Weights in Pounds.]

JUNE 19.—By the steamer *Rio de Janeiro* from Pará and Manáos:

	Fine.	Medium.	Coarse.	Caucho.	Total.
Meyer & Brown	27,100	1,100	14,000	28,000=	70,200
H. A. Astlett & Co.	57,400	5,300	27,000	71,800=	161,500
H. C. Kupper	109,900	500	2,100	4,900=	117,400
Arnold & Zeiss	75,200	5,500	29,200	.....=	109,900
G. Amsinck & Co.	27,100	800	10,200	55,000=	93,100
A. D. Straus & Co.	54,700	.....	.....	.....=	54,700
Henderson & Korn	700	3,600	17,200	17,300=	38,800
Pell & Dumont	31,600	3,000	.....	.....=	34,600
Crossman & Sielcken	19,300	200	4,000	100=	23,600
Hagemeyer & Brunn	8,200	3,000	4,200	2,300=	17,700
W. R. Grace & Co.	700	100	4,500	1,900=	7,200
Various	80,900	200	5,900	42,300=	129,300
Totals	492,800	23,300	118,300	223,600=	858,000

JUNE 30.—By the steamer *Minas Geraes* from Pará and Manáos:

Meyer & Brown	61,900	4,300	25,500	2,800=	94,500
Henderson & Korn	700	.....	27,100	46,800=	74,600
General Rubber Co.	43,200	5,700	3,200	.....=	52,100
J. T. Johnstone & Co.	.....	.....	22,000	23,800=	45,800
G. Amsinck & Co.	1,800	400	11,200	31,000=	44,400
Paul Bertuch	23,500	3,500	11,100	200=	38,300
Arnold & Zeiss	.....	.....	11,300	20,000=	31,300
Hagemeyer & Brunn	6,400	300	1,000	13,700=	21,400
W. R. Grace & Co.	10,200	.....	.....	.....=	10,200
H. A. Astlett & Co.	3,200	4,300	.....	.....=	7,500
Totals	150,900	18,500	112,400	138,300=	420,100

JULY 3.—By the steamer *Stephen* from Pará and Manáos:

Meyer & Brown	73,400	6,600	43,900	46,500=	170,400
Arnold & Zeiss	79,000	8,300	55,700	10,700=	153,700
Robinson & Co.	52,200	6,500	27,500	33,800=	120,000
H. A. Astlett & Co.	22,800	17,000	41,100	2,400=	83,300
Pell & Dumont	34,200	2,800	11,200	.....=	48,200
W. R. Grace & Co.	21,700	700	2,200	21,200=	45,800
Paul Bertuch	26,400	4,900	300	.....=	31,600
Henderson & Korn	2,600	300	1,100	25,600=	29,600
Aldens' Successors, Ltd.	400	1,800	5,400	.....=	7,600
Totals	312,700	48,900	188,400	140,200=	690,200

JULY 17.—By the steamer *Boniface* from Pará:

Meyer & Brown	32,600	3,700	38,000	39,500=	113,800
Arnold & Zeiss	62,100	6,600	50,700	11,900=	131,300
H. A. Astlett & Co.	27,100	1,800	6,600	32,000=	67,500
Paul Bertuch	34,500	.....	10,000	10,700=	55,200
Henderson & Korn	.....	7,500	29,700	.....=	37,200
G. Amsinck & Co.	7,900	400	8,600	.....=	16,900
Totals	164,200	20,000	143,600	94,100=	421,900

JULY 18.—By the steamer *Sao Paulo* from Pará and Manáos:

Meyer & Brown	33,800	2,100	31,700	94,600=	162,200
Arnold & Zeiss	68,800	5,100	51,600	19,000=	144,500
H. A. Astlett & Co.	19,400	14,600	8,100	25,200=	67,300
Henderson & Korn	18,200	1,400	24,800	.....=	44,400
Robinson & Co.	17,100	1,700	.....	11,400=	30,200
Pell & Dumont	.....	.....	4,700	11,100=	15,800
J. T. Johnstone & Co.	11,100	700	.....	.....=	11,800
G. Amsinck & Co.	5,000	.....	3,200	600=	8,800
Raw Products Co.	.....	.....	.....	8,100=	8,100
Lazard Freres	6,300	.....	.....	.....=	6,300
Paul Bertuch	700	.....	.....	.....=	700
Totals	180,400	25,600	124,100	170,000=	500,100

PARAS.

	Pounds.
JUNE 26.—By the *Ancon*=Colon:	
G. Amsinck & Co. (Fine)	40,500
G. Amsinck & Co. (Coarse)	2,000
W. R. Grace & Co. (Fine)	11,000 — 53,500
JUNE 28.—By the *Ulysses*=Colon:	
G. Amsinck & Co. (Fine)	17,000
G. Amsinck & Co. (Coarse)	1,000
W. R. Grace & Co. (Fine)	6,000 — 24,000
JUNE 30.—By the *Californian*=Montevideo:	
A. D. Straus & Co. (Fine)	20,000
JULY 10.—By the *Caracas*=Puerto Cabello:	
R. Fabien & Co. (Fine)	9,000
R. Fabien & Co. (Coarse)	3,000
General Export & Commission Co. (Fine)	5,000
General Export & Commission Co. (Coarse)	2,000 — 19,000
JULY 12.—By the *Cristobal*=Colon:	
G. Amsinck & Co. (Fine)	25,000
G. Amsinck & Co. (Coarse)	4,000
Neuss, Hesslein & Co. (Fine)	14,000
Neuss, Hesslein & Co. (Coarse)	3,000
Muller, Schall & Co. (Caucho)	11,700
W. R. Grace & Co. (Fine)	8,500 — 66,200
JULY 12.—By the *Allianca*=Colon:	
W. R. Grace & Co. (Fine)	4,000
JULY 13.—By the *Nordhvalen*=Montevideo:	
Neuss, Hesslein & Co. (Fine)	2,500

	Pounds.
JULY 15.—By the *Maraval*=Ciudad Bolivar:	
Yglesias, Lobo & Co. (Fine)	25,000
Yglesias, Lobo & Co. (Coarse)	10,000
R. Fabien & Co. (Fine)	25,000
R. Fabien & Co. (Coarse)	5,000 — 65,000

CENTRALS.

[*This sign, in connection with imports of Centrals, denotes Guayule rubber.]

JUNE 22.—By the *Proteus*=New Orleans:	
G. Amsinck & Co.	20,000
JUNE 23.—By the *El Siglo*=Galveston:	
Various	*45,000
JUNE 26.—By the *Esperanza*=Mexico:	
Graham, Hinckley & Co.	*1,000
H. Marquardt & Co.	*1,000
G. Schaumann & Co.	*5,000 — *7,000
JUNE 27.—By the *Guantanamo*=Tampico:	
C. Tennant, Sons & Co.	*100,000
JUNE 26.—By the *Ancon*=Colon:	
G. Amsinck & Co.	20,300
Muller, Schall & Co.	1,400
Goldsmith & Co.	16,200
Charles E. Griffin	4,300
A. M. Capen's Sons	1,000
Lazard Freres	5,600
Gontard & Co.	2,000
Meyer Hecht	1,200
Silvia Bussineus & Co.	1,400
American Trading Co.	2,000
Mecke & Co.	2,200

	Pounds.
H. Wolff & Co.	1,000
Fidanque Bros. & Co.	1,200
Various	5,500 — 65,300
JUNE 26.—By the *Sixaola*=Puerto Cortez:	
A. Rosenthal & Sons	4,000
Broedermann Litzrodt	1,000
Republic Rubber Co.	300
Eggers & Heinlein	300
W. R. Grace & Co.	800
J. S. Sembrada & Co.	500
W. H. Knox	500 — 7,400
JUNE 26.—By the *Tenadores*=Port Limon:	
A. A. Linde & Co.	700
Isaac Brandon & Bros.	300
H. Marquardt & Co.	200
Gontard & Co.	200 — 1,400
JUNE 27.—By the *Guantanamo*=Mexico:	
J. A. Medina & Co.	*1,000
Graham, Hinckley & Co.	*500
General Export & Commission Co.	*200
Various	*3,500 — *5,200
JUNE 28.—By the *Ulysses*=Colon:	
G. Amsinck & Co.	27,000
A. M. Capen's Sons	12,000
Lauman & Kemp	2,700
R. G. Barthold & Co.	1,300
Gontard & Co.	2,000
Harburger & Stack	300
Silvia Bussineus & Co.	900
H. Mann & Co.	1,000
J. S. Sembrada & Co.	2,200
Pablo, Calvet & Co.	2,500
Camacho, Roldan & Van Sickel	6,300
H. Wolff & Co.	1,900 — 59,200

		POUNDS.
JUNE 30.—By the *Santa Marta*=Cartagena:		
Andean Trading Co.		2,000
JULY 3.—By the *Colombia*=Cartagena:		
G. Amsinck & Co.	3,000	
Pottberg, Ebeling & Co.	400	
H. Wolff & Co.	100	3,500
JULY 3.—By the *Metapan*=Port Limon:		
Isaac Brandon & Bros.		1,000
JULY 5.—By the *Panama*=Colon:		
Lawrence Johnson & Co.	2,500	
American Trading Co.	1,000	3,500
JULY 6.—By the *Saramacca*=Cartagena:		
Andean Trading Co.		4,500
JULY 6.—By the *Bygland*=Colombia:		
Pottberg, Ebeling & Co.	4,000	
A. Held	3,000	7,000
JULY 6.—By the *Almirante*=Cartagena:		
Cowdrey & Co.	1,500	
H. Wolff & Co.	500	2,000
JULY 10.—By the *Tivives*=Cortez:		
A. Rosenthal & Sons.	5,500	
M. C. Keith.	1,000	
Eggers & Heinlein.	500	7,000
JULY 10.—By the *Monterey*=Mexico:		
Graham, Hinkley & Co.	*8,000	
American Trading Co.	*6,000	
G. Amsinck & Co.	*1,000	*15,000
JULY 10.—By the *Monterey*=Tampico:		
C. Tennant Sons & Co.		*15,000
JULY 11.—By the *Pastores*=Bocas del Toro:		
Cowdrey & Co.	2,500	
A. A. Linde & Co.	1,000	
Isaac Brandon & Bros.	300	
H. Marquardt & Co.	200	4,000
JULY 11.—By the *El Oriente*=Galveston:		
Various		*33,500
JULY 12.—By the *Cristobal*=Colon:		
G. Amsinck & Co.	7,500	
Otto Gerdan & Co.	3,500	
Lawrence Johnson & Co.	2,000	
Pablo, Calvet & Co.	17,000	
J. S. Sembrada & Co.	12,000	
Isaac Brandon & Bros.	2,000	
Various	5,500	49,500
JULY 12.—By the *Allianca*=Colon:		
G. Amsinck & Co.	7,500	
Lazard Freres	2,000	
Mecke & Co.	2,800	
Harburger & Stack	700	
H. Mann & Co.	400	13,400
JULY 13.—By the *Zacapa*=Cartagena:		
G. Amsinck & Co.	4,000	
Hills Bros. & Co.	1,000	5,000
JULY 14.—By the *El Occidente*=Galveston:		
Various		*33,500
JULY 15.—By the *Admiral Sebill*=Mexico:		
Graham, Hinkley & Co.	*2,000	
Various	*500	*2,500
JULY 19.—By the *El Mar*=Galveston:		
Various		*11,000
JULY 19.—By the *El Sud*=Galveston:		
Various		*1,000

AFRICANS.

JUNE 22.—By the *Rotti*=Batavia:		
General Rubber Co.	135,000	
Karl Schroeder	80,000	
Various	75,000	290,000
JUNE 22.—By the *Idaho*=Hull:		
Arnold & Zeiss		2,200
JUNE 23.—By the *Carpathia*=Liverpool:		
Arnold & Zeiss.	56,000	
Goodyear Tire & Rubber Co.	33,500	
F. Stern & Co.	18,000	
Rubber Trading Co.	2,200	109,700
JUNE 27.—By the *Patroclus*=Batavia:		
Karl Schroeder		60,000
JUNE 27.—By the *Galileo*=Hull:		
E. J. Curry		15,000
JUNE 30.—By the *Queen Margaret*=Liverpool:		
The B. F. Goodrich Co.	3,000	
Goodyear Tire & Rubber Co.	11,200	14,200
JULY 3.—By the *Orduna*=Liverpool:		
Arnold & Zeiss.	6,000	
F. Stern & Co.	2,000	8,000
JULY 12.—By the *St. George*=Liverpool:		
Arnold & Zeiss	22,500	
Swinehart Tire & Rubber Co.	2,500	25,000

		POUNDS.
JULY 17.—By the *Finland*=Liverpool:		
F. Stern & Co.		1,000

MANICOBA.

JUNE 30.—By the *Minas Geraes*=Bahia:		
Adolph Hirsch & Co.	11,000	
G. Amsinck & Co.	14,500	25,500
JULY 3.—By the *Eastern Prince*=Bahia:		
Adolph Hirsch & Co.	35,000	
Various	7,000	42,000
JULY 3.—By the *Eastern Prince*=Rio de Janeiro:		
G. Amsinck & Co.		33,500
JULY 11.—By the *Strabo*=Bahia:		
Adolph Hirsch & Co.		67,000
JULY 17.—By the *Boniface*=Pernambuco:		
Rossbach Bros. & Co.	7,500	
G. Amsinck & Co.	4,500	12,000
JULY 17.—By the *Boniface*=Ceara:		
Adolph Hirsch & Co.		5,500
JULY 18.—By the *Sao Paulo*=Bahia:		
Lawrence Johnson & Co.	8,000	
F. Blumenthal & Co.	2,500	10,500

PLANTATIONS.

JUNE 22.—By the *Rotti*=Batavia:		
Meyer & Brown	120,000	
Edward Maurer & Co., Inc.	150,000	
G. Amsinck & Co.	125,000	
L. Littlejohn & Co.	113,628	
J. T. Johnstone & Co.	88,300	
Aldens' Successors, Ltd.	5,700	
Henderson & Korn	10,000	
General Rubber Co.	33,500	
F. H. Cone	160,000	
C. B. Richard & Co.	160,000	
Manhattan Rubber Manufacturing Co.	22,500	
Stein, Hirsch & Co.	30,000	
Rubber Trading Co.	25,000	
E. Miltenberg	10,000	
Goodyear Tire & Rubber Co.	45,000	
Various	60,000	1,157,628
JUNE 22.—By the *Port Nicholson*=London:		
Meyer & Brown	22,500	
Edward Maurer & Co.	38,000	
The B. F. Goodrich Co.	370,000	
Robinson & Co.	9,000	
Charles Wilson Co., Inc.	110,000	
Arnold & Zeiss.	120,000	669,500
JUNE 23.—By the *Carpathia*=Liverpool:		
The B. F. Goodrich Co.	22,500	
General Rubber Co.	2,200	24,700
JUNE 23.—By the *Crewe Hall*=Colombo:		
Meyer & Brown	67,000	
L. Littlejohn & Co.	66,760	
Goodyear Tire & Rubber Co.	33,500	
Henderson & Korn	11,200	
I. T. Johnstone & Co.	30,000	
Edward Maurer & Co., Inc.	6,000	
Arnold & Zeiss	80,000	
Various	7,500	301,960
JUNE 24.—By the *City of Manchester*=Colombo:		
Meyer & Brown.	112,000	
I. T. Johnstone & Co.	10,000	
Edward Maurer & Co., Inc.	9,000	
Arnold & Zeiss.	11,200	
L. Littlejohn & Co.	46,320	188,520
JUNE 26.—By the *Andania*=London:		
Meyer & Brown.	9,000	
General Rubber Co.	310,000	
Arnold & Zeiss.	150,000	
I. T. Johnstone & Co.	73,000	
Robinson & Co.	33,500	
Aldens' Successors, Ltd.	21,900	
Charles T. Wilson Co., Inc.	7,000	
Edward Maurer & Co., Inc.	5,000	609,400
JUNE 26.—By the *Philadelphian*=London:		
Michelin Tire Co.	90,000	
L. Littlejohn & Co.	44,595	
F. Stern & Co.	35,000	
Rubber Trading Co.	11,200	180,795
JUNE 27.—By the *Patroclus*=Batavia:		
Meyer & Brown	212,000	
Edward Maurer & Co., Inc.	330,000	
General Rubber Co.	22,500	
G. Amsinck & Co.	100,000	
Manhattan Rubber Manufacturing Co.	30,000	
I. T. Johnstone & Co.	40,200	
W. R. Grace & Co.	25,000	
Henderson & Korn	45,000	
Goodyear Tire & Rubber Co.	95,000	
L. Littlejohn & Co.	116,875	
Rubber Trading Co.	95,000	
Various	125,000	1,236,575

		POUNDS.
JUNE 28.—By the *Manchuria*=London:		
Charles T. Wilson Co., Inc.	115,000	
General Rubber Co.	100,000	
L. Littlejohn & Co.	196,250	
F. Stern & Co.	25,000	
Rubber Trading Co.	6,000	442,250
JUNE 28.—By the *Michigan*=London:		
Meyer & Brown.	22,500	
Raw Products Co.	22,500	
Goodyear Tire & Rubber Co.	22,500	67,500
JUNE 30.—By the *Queen Margaret*=Liverpool:		
The B. F. Goodrich Co.	9,000	
General Rubber Co.	4,500	13,500
JULY 3.—By the *Vinovia*=London:		
Meyer & Brown	50,000	
The B. F. Goodrich Co.	600,000	
J. T. Johnstone & Co.	75,000	
Michelin Tire Co.	56,000	
Edward Maurer & Co., Inc.	22,500	803,500
JULY 3.—By the *Orduna*=Liverpool:		
The B. F. Goodrich Co.		10,000
JULY 6.—By the *Minnehaha*=London:		
Arnold & Zeiss.	45,000	
E. J. Curry	45,000	
F. Stern & Co.	25,000	115,000
JULY 3.—By the *City of Calcutta*=Colombo:		
J. T. Johnstone & Co.	15,000	
Aldens' Successors, Ltd.	22,200	
Arnold & Zeiss.	27,000	
W. H. Stiles & Co.	55,000	
Edward Maurer & Co., Inc.	2,200	
L. Littlejohn & Co.	59,790	181,190
JULY 3.—By the *Alaunia*=London:		
Meyer & Brown	56,000	
Edward Maurer & Co., Inc.	67,000	
The B. F. Goodrich Co.	170,000	
L. Littlejohn & Co.	99,196	
Arnold & Zeiss.	45,000	
Charles T. Wilson Co., Inc.	115,000	
Robinson & Co.	15,200	
Raw Products Co.	4,500	567,896
JULY 10.—By the *Lancastrian*=London:		
F. Stern & Co.	50,000	
Goodyear Tire & Rubber Co.	8,000	
Rubber Trading Co.	7,000	65,000
JULY 10.—By the *Karonga*=Colombo:		
Meyer & Brown	230,000	
L. Littlejohn & Co.	33,670	
I. T. Johnstone & Co.	33,800	
Robinson & Co.	11,200	
W. R. Grace & Co.	2,000	
Edward Maurer & Co., Inc.	40,000	
Arnold & Zeiss.	22,500	
Henderson & Korn.	4,500	
W. H. Stiles & Co.	22,500	399,370
JULY 12.—By the St. *George*=Liverpool:		
The B. F. Goodrich Co.		13,500
JULY 12.—By the *Vandalia*=London:		
The B. F. Goodrich Co.	410,000	
Aldens' Successors, Ltd.	179,000	
Charles T. Wilson Co., Inc.	22,500	
L. Littlejohn & Co.	33,500	
Robinson & Co.	11,200	
Raw Products Co.	4,500	
J. T. Johnstone & Co.	5,700	666,400
JULY 14.—By the *Korea*=London:		
Meyer & Brown	50,000	
Charles T. Wilson Co., Inc.	11,000	
F. Stern & Co.	9,000	70,000
JULY 17.—By the *Mesaba*=London:		
Michelin Tire Co.	50,000	
Rubber Trading Co.	15,680	64,320
JULY 17.—By the *Netherby Hall*—Singapore:		
Meyer & Brown	11,200	
Edward Maurer & Co., Inc.	7,000	
Henderson & Korn.	45,000	
Charles T. Wilson Co., Inc.	27,000	
Fox & Co.	25,000	
Aldens' Successors, Ltd.	7,000	
L. Littlejohn & Co.	6,000	
J. T. Johnstone & Co.	18,000	
Goodyear Tire & Rubber Co.	16,000	162,200
JULY 17.—By the *Foyle*=London:		
The B. F. Goodrich Co.	180,000	
Arnold & Zeiss	22,500	
Edward Maurer & Co., Inc.	22,500	
General Rubber Co.	4,500	229,500
JULY 19.—By the *Saronia*=Liverpool:		
The B. F. Goodrich Co.		13,500

CRUDE RUBBER ARRIVALS AT SEATTLE.

[*The Figures Indicate Weights in Pounds.*]
**Figured 130 pounds net to the case.*

PLANTATION.

TO AKRON.

JUNE 26.—By the steamer *Canada Maru.*

Consignee—	POUNDS.
British Consul General.	
Guthrie & Co.	10,400

		Pounds.
TO NEW YORK.		
Henderson & Korn.		
International Trading Co.....	74,620	
Guthrie & Co.....	5,590	80,210
TO SEATTLE.		
British Consul General.		
Guthrie & Co.....		6,110
TO SEATTLE.		
JUNE 29.—By the steamer *Inaba Maru.*		
Nippon Yusen Kaisha.....		7,540
TO AKRON		
JULY 3.—By the steamer *Titan.*		
J. T. Johnstone & Co.		
Planters Stores & Agency Co.	9,100	
Kajang Rubber Estate.....	2,470	
Goodyear Tire & Rubber Co.		
Harrisons & Crosfield.....	121,290	
Anglo-Malay Rubber Co.....	53,820	
Duff Development Co.....	17,030	203,710
TO NEW YORK.		
United States Rubber Co.		
General Rubber Co.....	198,380	
Henderson & Korn.		
International Trading Co.....	44,460	
J. T. Johnstone & Co.		
Duff Development Co.....	8,320	
Arnold & Zeiss.		
Weller & Co.....	34,320	
C. W. Mackie & Co.....	20,020	
Fox & Co.		
Weller & Co.....	47,450	
L. Littlejohn & Co.		
C. W. Mackie & Co.....	29,120	
Arthur Meyer & Co.		
Inch Kenneth Rubber Estate..	2,470	384,540
TO SEATTLE.		
W. R. Grace & Co.		
Cumberbatch & Co.....	11,310	
Guthrie & Co.....	6,240	
R. T. Ried & Co.....	6,240	
George Stewart & Co.....	4,810	
Sungei Pureen Rubber Co....	2,470	
Cheras Rubber Estate.....	2,470	33,540
TO SAN FRANCISCO.		
JULY 8.—By the steamer *Gishun Maru.*		
W. R. Grace & Co.		
Sandilands, Buttery & Co.....		45,500
TO AKRON.		
JULY 20.—By the steamer *Manila Maru.*		
The B. F. Goodrich Co.		
W. T. Easley	67,470	
Goodyear Tire & Rubber Co.		
Rubber Estates of Johore.....	18,590	86,060
TO SEATTLE.		
JULY 20.—By the steamer *Bankoku Maru.*		
The B. F. Goodrich Co.		
W. T. Easley	688,220	
L. Littlejohn & Co.		
Paterson, Simons & Co.....	70,460	
W. R. Grace & Co.		
Penang Rubber Estates.....	11,050	
Malaysia Rubber Co., Ltd.....	5,720	775,450

		Pounds.
GUTTA JELUTONG.		
TO SEATTLE.		
JULY 3.—By the steamer *Titan.*		
Dexter-Horton National Bank.		
Jaeger & Co.....		40,170
TO SEATTLE.		
JULY 8.—By the steamer *Gishun Maru.*		
L. Littlejohn & Co.		
Paterson, Simons & Co.....	105,170	
Katz Bros.	55,120	
Adamson, Gelfellow & Co.....	44,980	
Huttenbach Bros. & Co.....	6,370	211,640
TO SEATTLE.		
JULY 20.—By the steamer *Bankoku Maru.*		
L. Littlejohn & Co.		
Paterson, Simons & Co.....	204,750	
Jaeger & Co.....	11,180	215,930
GUTTA PERCHA.		
TO SEATTLE.		
JULY 8.—By the steamer *Gishun Maru.*		
L. Littlejohn & Co.		
Katz Bros.		21,450
TO SEATTLE.		
JULY 20.—By the steamer *Bankoku Maru.*		
L. Littlejohn & Co.		
Katz Bros.		15,340
GUTTA SIAK.		
TO SEATTLE.		
JULY 20.—By the steamer *Bankoku Maru.*		
L. Littlejohn & Co.		
Katz Bros.		25,610

CUSTOM HOUSE STATISTICS.

PORT OF DETROIT—MAY, 1916.

IMPORTS:	Pounds.	Value.
Rubber scrap	15,950	$136
EXPORTS:		
Rubber scrap	6,458	$491
Reclaimed rubber	87,719	10,324
Totals	94,167	$10,815

PORT OF NEW YORK—MAY, 1916.

IMPORTS:		
India rubber 19,650,628		$12,732,501
Balata	75,062	33,855
Gutta jelutong (Pontianak).	308,797	19,035
Gutta percha	421,783	22,539
Rubber scrap	986,950	64,544
Manufactures of gutta percha	.....	20,500
Manufactures of india rubber	.....	32,864
Substitutes, elasticon, etc...	.....	276
Totals 21,443,220		$12,926,114
EXPORTS:		
India rubber	22,628	$16,744
Balata	44,800	20,000
Reclaimed rubber	90,174	16,870
Totals	157,602	$53,614

PORT OF BOSTON—JUNE, 1916.

IMPORTS:		
India rubber	313,766	$208,935
Gutta jelutong (Pontianak).	658,295	29,668
Gutta percha	79,245	8,263
Manufactures of india rubber	.....	8,830
Totals	1,051,306	$255,696
EXPORTS:		
India rubber boots.....*pairs*	21,392	$43,215
India rubber shoes.....*pairs*	91,326	37,768
Rubber scrap	4,457	690
Automobile tires	.....	156,124
Other rubber tires.....	.....	25
Belting, hose, etc.....	.....	49,734
All other manufactures of rubber	.....	83,257
Total	.....	$370,813

PORT OF CHICAGO—JUNE, 1916.

IMPORTS:		
Gutta jelutong (Pontianak).	.....	$1,610

PORT OF CLEVELAND—JUNE, 1916.

IMPORTS:		
India rubber	329,530	$231,822
Manufactures of india rubber	.....	2,990
Totals	329,530	$234,812

PORT OF GALVESTON—JUNE, 1916.

Manufactures of india rubber	.....	$15

PORT OF NEW ORLEANS—JUNE, 1916.

India rubber	17,693	$6,203

PORT OF PHILADELPHIA—JUNE, 1916.

EXPORTS:		
Belting, hose, etc.....	.....	$4,193

PORT OF SAN FRANCISCO—JUNE, 1916.

IMPORTS:		
India rubber	274,363	$193,975
Gutta percha	360	52
Manufactures of india rubber	.....	436
Totals	274,723	$194,463

PORT OF SEATTLE—JUNE, 1916.

IMPORTS:		
India rubber	2,881,740	$1,995,228
Gutta jelutong (Pontianak).	2,112,026	109,952
Gutta percha	246,762	29,242
Manufactures of india rubber	.....	40
Totals	5,240,528	$2,134,462

PLANTATION RUBBER FROM THE FAR EAST.

TOTAL EXPORTS FROM MALAYA.

(From January 1, 1916, to dates named. Reported by Barlow & Co., Singapore. These figures include the production of the Federated Malay States, but not of Ceylon.)

To—	From Singapore. April 30, 1916.	From Malacca. April 30, 1916.	From Penang. April 30, 1916.	From Port Swettenham. May 18, 1916.	Totals.
United Kingdom..*lbs.*	10,291,600	1,538,534	7,527,100	8,250,747	27,607,981
The Continent	4,888,533	.....	20,667	.....	4,909,200
Japan	1,349,479	.....	.....	.....	1,349,479
Ceylon	76,894	.....	225,466	605,248	907,608
United States 27,333,200		.....	3,106,667	.....	30,439,867
Australia	130,047	.....	.....	.....	130,047
Totals 44,699,753		1,538,534	10,879,900	8,855,995	65,344,182
For same period, 1915	20,651,757	3,276,002	8,230,797	10,915,581	43,074,137
For same period, 1914	12,167,673	1,772,527	5,398,000	10,860,277	30,198,476
For same period, 1913	8,614,698	.....	4,589,733	10,530,769	13,735,200

FEDERATED MALAY STATES RUBBER EXPORTS.

An official cablegram from Kuala Lumpur gives the figures of the export of plantation rubber from the Federated Malay States during the month of June as 5,114 tons against 3,956 tons in May last and 3,403 tons in the corresponding month last year. The total export for the six months of the current year amounted to 27,091 tons against 19,190 tons in 1915 and 13,850 tons in 1914. Appended are the comparative figures:

	1914.	1915.	1916.
January .....*tons*	2,542	3,473	4,471
February	2,364	3,411	5,207
March	2,418	3,418	4,429
April	2,151	2,777	3,914
May	2,069	2,708	3,956
June	2,306	3,403	5,114
Totals	13,850	19,190	27,091

STRAITS SETTLEMENTS RUBBER EXPORTS.

A cablegram from the Colonial Secretary, Singapore, notifies that the export of plantation rubber from Straits Settlements ports in the month of May amounted to 3,274 tons, compared with 4,219 tons in April and 3,588 tons in the corresponding month last year. The total export for the first five months of the current year amounted to 19,776 tons against 13,360 tons in 1915 and 7,026 tons in 1914. Appended are the comparative statistics:

	1914.	1915.	1916.
January .....*tons*	1,181	2,576	4,443
February	1,703	2,741	3,359
March	1,285	2,477	4,481
April	1,548	1,978	4,219
May	1,309	3,588	3,274
Totals	7,026	13,360	19,776

These figures include transhipments of rubber from various places in the neighborhood of the Straits Settlements such as Java, Sumatra, Borneo and the non-Federated Malay States as well as rubber actually exported from the Colony, but do not include rubber exports from the Federated Malay States.

EXPORTS OF CEYLON GROWN RUBBER.

(From January 1 to June 12, 1915 and 1916. Compiled by the Ceylon Chamber of Commerce.)

To—	1915.	1916.
United States .....*pounds*	5,084,644	12,172,076
Canada and Newfoundland.....	340,140	2,240
France	209,576	691,092
Russia	327,720	179,010
United Kingdom 11,672,419		8,336,026
Australia	168,081	407,451
India	500	628
Straits Settlements	119,933	.....
Japan	183,739	130,516
Totals 18,106,752		21,919,039

(Same period 1914, 14,454,752 pounds; same period 1913, 9,675,521.) The

export figures of rubber, given in the above table for 1914, include the imports re-exported. (These amount to 1,478,849 pounds from the Straits Settlements and 265,660 pounds from India.) To arrive at the total quantity of Ceylon rubber exported for that year deduct these imports from the total exports. The figures for 1915 and 1916 are for Ceylon rubber only.

IMPORTS AND EXPORTS OF RUBBER AND GUTTA AT SINGAPORE.

IMPORTS.

May, 1916.

From—	Para Rubber.	Para Rubber for Treatment.	Borneo Rubber.	Gutta Percha.	Gutta Jelutong.
Federated Malay States—					
Port Swettenham.*pounds*	1,155,066	.....	.....	.....	.....
Teluk Anson	721,600	.....	.....	.....	.....
Muar	560,800	41,866	.....	.....	.....
Kelantan	87,333	.....	.....	.....	.....
Port Dickson	73,600	.....	.....	.....	.....
Kuantan	25,466	.....	.....	.....	.....
Pahang	9,200	.....	.....	.....	.....
Rengat	8,133	5,866	.....	.....	.....
Mersing	1,333	8,800	.....	.....	.....
Trengganu	133	.....	.....	.....	.....
Totals	2,642,664	56,532	.....	.....	.....
Sumatra—					
Djambi	168,666	.....	.....	3,066	20,000
Bardjermassin	38,800	56,303	5,600	100,533	127,200
Palembang	17,333	.....	2,800	533	513,466
Passir	15,866	.....	.....	.....	.....
Belawan	14,800	118,266	.....	.....	.....
Indraghiri	10,533	18,800	.....	.....	44,933
Asahan	6,533	.....	.....	.....	.....
Muntok	4,000	.....	.....	.....	.....
Siak	3,466	.....	.....	.....	.....
Port Bon	.....	.....	2,133	3,733	75,733
Bengkalis	.....	.....	400	.....	.....
Totals	279,997	193,369	10,933	107,865	781,332
Borneo—					
Sarawak	86,400	42,133	.....	12,400	2,088,133
Pontianak	52,066	2,133	18,266	4,800	46,400
Sambas	27,866	.....	.....	1,200	54,400
Sibu	17,600	.....	5,200	16,800	221,466
Sirgkawang	4,800	.....	.....	.....	.....
Samarinda	2,400	.....	6,000	1,600	.....
Totals	191,132	44,266	29,466	36,800	2,410,399
British North Borneo—					
Jesselton	44,533	195,866	.....	2,533	.....
Labuan	25,066	1,200	.....	7,866	269,600
Sandakan	12,400	33,200	.....	.....	.....
Kudat	5,200	19,866	133	800	.....
Totals	87,199	250,132	133	11,199	269,600
Straits Settlements—					
Malacca	572,800	703,200	.....	.....	.....
Penang	521,600	294,533	.....	.....	.....
S. Pandjang	400	.....	.....	.....	.....
Totals	1,094,800	997,733	.....	.....	.....
Java—					
Batavia	155,466	.....	.....	.....	.....
Sourabaya	54,133	.....	.....	.....	.....
Deli	40,666	693,600	.....	.....	.....
Totals	250,265	693,600	.....	.....	.....
Other Ports	231,466	33,600	26,400	48,800	181,466
Grand Totals	4,777,523	2,269,232	66,932	204,664	3,642,797

EXPORTS.

May, 1916.

To—	Para Rubber.	Para Rubber Transhipped.	Borneo Rubber.	Gutta Percha.	Gutta Jelutong.
NORTH AMERICA:					
United States—					
Seattle.....*pounds*	809,866	54,933	.....	257,600	2,252,933
New York	726,533	182,933	.....	124,400	219,200
Akron	693,466	252,266	.....	.....	.....
San Francisco	145,600	23,200	.....	.....	11,333
Canada—					
Ontario (Toronto)	128,000	.....	.....	.....	.....
Vancouver	702,000	.....	.....	.....	.....
Totals	3,205,465	513,332	.....	382,000	2,483,466
EUROPE:					
England (London)	594,933	1,168,000	.....	235,333	4,400
Russia (Vladivostock)	260,133	.....	.....	.....	.....
France (Marseilles)	136,900	20,800	33,333	.....	.....
Totals	991,966	1,188,800	33,333	235,333	4,400
Grand Totals	4,197,431	1,702,132	33,333	617,333	2,487,866

EXPORTS OF INDIA RUBBER FROM PARA AND MANAOS DURING JUNE, 1916.

EXPORTERS.	NEW YORK. Fine.	Medium.	Coarse.	Caucho.	Totals.	EUROPE. Fine.	Medium.	Coarse	Caucho.	Totals.	Grand Totals.
J. Marques .....*kilos*	1,968	3,868	22,687	58,478	87,001	21,920	.....	13,262	10,720	45,902	132,903
Suter & Co.	30,688	2,396	21,987	10,985	66,056	5,280	.....	.....	40,260	45,540	111,596
General Rubber Co. of Brazil	37,096	4,094	23,083	1,315	65,588	10,880	680	.....	.....	11,560	77,148
Fires Teixeira & Co.	26,950	1,678	28,177	11,341	68,146	.....	.....	.....	.....	.....	68,146
Berringer & Co.	50,126	.....	.....	.....	50,126	.....	.....	.....	.....	.....	50,126
Seligmann & Co.	15,227	38	2,677	28,159	46,101	.....	.....	.....	.....	.....	46,101
G. Fradelizi & Co.	31,340	2,733	8,672	69	42,814	.....	.....	.....	.....	.....	42,814
Adelbert H. Alden, Limited	170	510	1,590	.....	2,270	4,420	.....	.....	990	5,410	7,680
Sundries	34,008	3,389	22,241	53,458	113,096	2,890	170	.....	13,879	16,939	130,035
	227,573	18,706	131,114	163,805	541,198	45,390	850	13,262	65,849	125,351	666,549
Exports from Itacoatiara	.....	.....	.....	.....	.....	1,000	181	1,072	277	2,530	2,530
Exports from Manáos	229,842	24,212	77,227	73,015	404,296	50,958	60,676	9,035	228,956	349,625	753,921
Totals	457,415	42,918	208,341	236,820	945,494	97,348	61,707	23,369	295,082	477,506	1,423,000

(Compiled by Suter & Co., Para.)

EXPORTS OF INDIA RUBBER FROM MANAOS DURING MAY, 1916.

EXPORTERS.	NEW YORK. Fine.	Medium.	Coarse.	Caucho.	Totals.	EUROPE. Fine.	Medium.	Coarse.	Caucho.	Totals.	Grand Totals.
Suter & Co.....*kilos*	72,768	7,104	30,841	15,413	126,126	1,700	480	170	38,400	40,750	166,876
Tancredo Porto & Co.	79,546	28,639	30,082	45,909	184,176	5,642	12,023	4,739	8,330	30,734	214,910
General Rubber Co. of Brazil	36,578	13,678	16,828	18,158	85,242	408	14,250	724	97,746	113,128	198,370
Armazens Andresen	71,625	4,581	6,757	81,709	164,672	.....	.....	.....	.....	.....	164,672
Adelbert H. Alden, Ltd.	.....	1,623	3,644	155	5,422	9,796	.....	.....	46,025	55,821	61,243
Gaspar Almeida & Co.	29,297	3,417	9,737	10,234	52,685	.....	.....	.....	.....	.....	52,685
I. G. Araujo	19,720	6,476	23,657	434	50,287	.....	160	1,150	750	2,060	52,347
Ohliger & Co.	51,874	13	20	.....	51,907	.....	.....	.....	.....	.....	51,907
H. Balding	25,649	.....	.....	14,077	39,726	.....	.....	.....	.....	.....	39,726
Manoel F. Carioca	16,150	1,600	4,050	.....	23,800	.....	.....	.....	.....	.....	23,800
Günzburger & Co.	1,246	92	2,913	12,356	16,607	.....	.....	.....	.....	.....	16,607
Amorim Irmaos	.....	.....	.....	.....	.....	3,582	1,380	4,756	2,126	11,844	11,844
Idao Martins d'Araujo	8,515	1,518	593	3	10,629	.....	.....	.....	.....	.....	10,629
Sundries	7,145	394	9,182	10,878	27,599	532	950	5,438	200	7,120	34,719
Totals	420,113	69,135	138,304	209,326	836,878	21,660	29,243	16,977	193,577	261,457	1,098,335
In transit, Iquitos	10,431	.....	4,419	71,467	86,317	6,975	.....	562	4,736	12,273	98,590
Totals: May, 1916	430,544	69,135	142,723	280,793	923,195	28,635	29,243	17,539	198,313	273,730	1,196,925
April, 1916	334,337	48,556	168,393	377,014	928,300	212,682	50,555	35,419	252,036	550,692	1,478,992
March, 1916	502,323	76,236	228,580	320,482	1,127,621	450,320	87,029	49,033	318,648	905,030	2,032,651
February, 1916	546,003	82,739	191,537	205,419	1,025,698	164,400	27,819	56,344	119,229	367,792	1,393,490
January, 1916	561,143	110,411	176,779	148,142	996,475	543,822	58,574	75,105	123,703	801,204	1,797,679

(Compiled by Suter & Co., Manáos.)

IMPORTS AND EXPORTS OF CRUDE AND MANUFACTURED RUBBER AT THE PORT OF NEW YORK.

IMPORTS.

Week Ending—	India Rubber. Pounds.	India Rubber. Value.	Scrap for Re-manufacture. Pounds.	Scrap for Re-manufacture. Value.	Balata. Pounds.	Balata. Value.	Gutta Jelutong. Pounds.	Gutta Jelutong. Value.	Gutta Percha. Pounds.	Gutta Percha. Value.
June 23, 1916	*	$3,404	.....	.....	.....	.....	.....	.....	*	$11,036
June 30, 1916	7,980,247	4,155,281	208,098	$20,730	16,630	$7,065	1,023,891	$42,717	101,058	18,167
	*	5,167	.....	.....	.....	.....	.....	.....	*	10
July 7, 1916	4,042,771	2,745,230	56,664	6,576	58,803	22,238	41,822	1,659	2,238	3,407
July 14, 1916	4,295,725	2,474,845	108,070	13,335	27,524	9,482	.....	.....	72,408	10,388
	2,072,290	1,222,236	163,214	12,448	23,499	9,477	.....	.....	.....	.....

*Pounds not specified.

EXPORTS.

FIGURES ISSUED FROM JUNE 26, 1916, TO JULY 24, 1916.

EXPORTED TO—	Belting, Hose and Packing.	Footwear. Boots.	Footwear. Shoes.	Tires. Auto.	Tires. Other.	Insulated Wire and Cables.	Other mnf. of India Rubber.	Fountain Pens.	Chewing Gum.	Reclaimed Rubber.	Scrap Rubber.
NORTH AMERICA:											
Bermuda	$63	.....	$100	.....	$14	.....	$207	$18	.....	.....	.....
British Honduras	.....	.....	.....	.....	4	.....	37	1	.....	.....	.....
Canada	.....	.....	.....	.....	.....	$264	.....	80	.....	.....	.....
Central American States—											
Costa Rica	40	.....	.....	$105	.....	204	455	.....	$133	.....	.....
Guatemala	450	.....	.....	1,099	.....	.....	681	.....	588	.....	.....
Honduras	641	.....	.....	866	281	.....	357	.....	.....	.....	.....
Nicaragua	24	.....	.....	.....	.....	.....	370	.....	.....	.....	.....
Panama	3,323	$96	1,886	5,920	160	6,693	5,556	.....	683	.....	.....
Salvador	813	.....	.....	.....	.....	.....	2,698	.....	.....	.....	.....
Mexico	2,812	.....	296	5,071	569	5,088	2,459	.....	131	.....	.....
Newfoundland	276	12,109	3,995	33	477	970	2,440	47	274	.....	.....
West Indies—											
British—											
Barbados	227	.....	.....	917	310	38	98	.....	1	.....	.....
Jamaica	1,141	.....	39	2,935	.....	5	478	.....	59	.....	.....
Trinidad and Tobago	786	.....	.....	1,433	239	136	1,084	.....	.....	.....	.....
Other British	686	.....	.....	361	209	.....	327	.....	21	.....	.....
Cuba	24,657	.....	488	46,799	17,821	29,405	28,347	1,108	608	$372	.....
Danish	344	.....	.....	221	.....	.....	18	7	.....	.....	.....
Dutch	105	5	.....	666	.....	8	85	148	2	.....	.....
French	51	.....	.....	51	.....	.....	73	.....	.....	.....	.....
Haiti	312	7	1	13	74	169	446	9	.....	.....	.....
Santo Domingo	2,444	3	42	2,834	385	251	783	.....	73	.....	.....
Totals, North America	$39,195	$12,220	$6,847	$69,324	$20,543	$43,231	$46,999	$1,418	$2,573	$372	.....
EUROPE:											
Denmark	$50	.....	.....	.....	$535	.....	$935	.....	.....	.....	.....
France	2,931	.....	$4,055	$33,038	43,197	$12,747	81,031	.....	$3,826	.....	$2,206
Greece	.....	.....	.....	.....	.....	.....	100	.....	922	.....	.....
Italy	59	.....	.....	$1,987	58,577	6,990	15,689	$1,803	.....	.....	.....
Netherlands	2,519	.....	.....	6,094	.....	22,894	5,485	783	.....	.....	.....
Norway	2,130	.....	.....	360	.....	14,655	1,579	.....	.....	.....	.....
Portugal	112	.....	.....	.....	.....	.....	329	439	.....	.....	.....
Russia in Europe	14	.....	.....	.....	.....	944	125	.....	.....	.....	.....
Spain	.....	.....	.....	.....	.....	2,830	215	989	.....	.....	.....
Sweden	3,914	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Switzerland	.....	.....	1,243	.....	.....	280	14	.....	.....	.....	.....
United Kingdom—											
England	27,731	.....	24,008	229,261	40,250	17,616	230,628	1,930	7,202	$7,450	13,594
Scotland	14,697	.....	.....	.....	.....	.....	2,383	305	.....	.....	16,484
Totals, Europe	$54,157	.....	$29,306	$320,740	$142,559	$78,956	$338,513	$6,249	$11,950	$7,450	$32,284
SOUTH AMERICA:											
Argentina	$19,265	.....	.....	$73,655	$8,911	$12,669	$40,579	$658	$1,284	.....	.....
Bolivia	.....	.....	.....	.....	.....	.....	333	.....	.....	.....	.....
Brazil	13,428	$69	$854	$4,781	972	93,669	30,691	435	.....	.....	.....
Chile	40,720	.....	524	1,777	3,697	4,403	3,113	39	.....	.....	.....
Columbia	1,479	.....	70	810	453	770	5,431	70	20	.....	.....
Ecuador	625	.....	.....	1,728	.....	120	737	4	.....	.....	.....
Guiana—British	48	.....	.....	496	758	12	42	.....	52	.....	.....
Dutch	124	.....	84	130	255	.....	216	.....	.....	.....	.....
Peru	1,483	1,050	.....	400	.....	4,216	786	.....	.....	.....	.....
Uruguay	4,417	.....	60	7,362	3,631	1,698	4,655	.....	455	.....	.....
Venezuela	441	.....	76	2,857	.....	3,405	4,313	.....	2	.....	.....
Totals, South America	$82,030	$1,119	$1,668	$143,996	$18,676	$120,962	$90,896	$1,206	$1,811	.....	.....
ASIA:											
China	$381	.....	$10	.....	.....	$143	$3,086	$36	.....	.....	.....
British East Indies—											
British India	892	.....	.....	$935	.....	.....	364	362	.....	.....	.....
Straits Settlements	.....	.....	363	7,035	$1,046	.....	18	.....	.....	.....	.....
Dutch East Indies	66	.....	.....	322	.....	.....	261	.....	.....	.....	.....
Hongkong	200	.....	.....	129	.....	.....	24	.....	.....	.....	.....
Japan	1,621	.....	704	64	.....	305	61	.....	.....	.....	.....
Totals, Asia	$3,160	.....	$1,077	$8,485	$1,046	$448	$3,814	$398	.....	.....	.....
OCEANIA:											
British—											
Australia and Tasmania	$22,909	.....	$2,218	$5,169	$3,037	$14,527	$21,161	$390	$1,373	.....	.....
New Zealand	970	.....	73	20,300	354	1,591	5,616	177	7,761	.....	.....
Philippine Islands	550	$61	756	1,401	2,169	7,006	4,333	384	588	.....	.....
Totals, Oceania	$24,429	$61	$3,047	$26,870	$5,560	$23,124	$31,110	$951	$9,722	.....	.....
AFRICA:											
British Africa—											
West	$1,122	.....	.....	$183	.....	.....	$500	.....	.....	.....	.....
South	37,305	$616	$171	2,109	$58,325	$1,684	2,848	.....	$387	.....	.....
East	1,143	.....	.....	686	.....	.....	.....	.....	26	.....	.....
Egypt	.....	.....	.....	164	.....	.....	2,660	.....	120	.....	.....
Portuguese Africa	1,313	.....	.....	.....	.....	.....	119	.....	.....	.....	.....
Totals, Africa	$40,883	$616	$171	$3,142	$58,325	$1,684	$6,127	.....	$533	.....	.....

In addition to the above Balata was exported to England valued at $22,208, and Gutta Percha valued at $2,520.

RUBBER STATISTICS FOR THE UNITED STATES.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

UNMANUFACTURED—*free:*	April, 1916. Pounds.	April, 1916. Value.	Ten Months Ending April, 1916. Pounds.	Ten Months Ending April, 1916. Value.
India rubber:				
From France	44,807	$34,297	424,304	$248,349
Portugal	304,118	130,244	2,744,446	1,083,298
United Kingdom	3,808,921	3,371,403	57,518,634	37,451,106
Central America and British Honduras	173,169	77,669	1,043,266	469,298
Mexico	75,617	29,289	2,975,699	1,124,767
Brazil	7,351,135	3,638,198	45,509,806	20,594,937
Other South America	277,932	127,039	4,976,228	2,246,781
East Indies	11,861,679	8,311,833	95,060,995	54,836,384
Other countries	15,354	11,394	632,910	440,514
Totals	23,912,732	$15,731,366	210,886,288	$118,495,434
Balata	256,774	108,139	2,303,845	897,417
Guayule gum	157,662	45,525	2,159,370	694,360
Gutta Jelutong	4,020,700	205,803	21,721,261	1,003,822
Gutta percha	226,965	26,669	2,066,604	229,398
Totals	28,574,833	$16,117,502	240,137,368	$121,320,231
Rubber scrap	1,217,604	112,919	13,957,867	1,097,569
Totals, unmanufactured	29,792,437	$16,230,421	254,095,235	$122,417,800
Chicle ..... *dutiable*	700,640	$285,728	6,142,314	$2,311,984
MANUFACTURED—*dutiable:*				
Gutta percha		$6,051		$13,201
India rubber		37,850		304,267
Totals, manufactured		$43,901		$317,468
Substitutes—elasticon, etc.		759		$15,168

EXPORTS OF DOMESTIC MERCHANDISE.

MANUFACTURED—	April, 1916. Pounds.	April, 1916. Value.	Ten Months Ending April, 1916. Pounds.	Ten Months Ending April, 1916. Value.
Automobile tires:				
To Russia in Europe*				$1,116,270
England		$913,483		7,405,965
Canada		58,877		999,278
Mexico		13,712		207,674
Cuba		53,533		405,132
Australia		157,976		1,251,928
New Zealand*		15,933		741,617
Philippine Islands		50,089		291,144
Other countries		183,581		2,199,054
Totals		$1,447,184		$14,618,062
All other tires		185,023		2,353,665
Belting, hose and packing		254,483		2,321,405
Rubber boots ..... *pairs*	39,761	82,449	661,404	1,485,737
Rubber shoes ..... *pairs*	207,599	105,247	1,640,213	867,270
Scrap and old rubber	312,024	28,264	3,373,653	340,781
Reclaimed rubber	581,657	85,011	5,568,931	755,960
Other rubber manufactures		778,376		5,576,883
Totals, manufactured		$2,966,037		$28,319,763
Fountain pens ..... *number*	45,127	$14,200	170,640	$123,823

EXPORTS OF FOREIGN MERCHANDISE.

UNMANUFACTURED—	April, 1916. Pounds.	April, 1916. Value.	Ten Months Ending April, 1916. Pounds.	Ten Months Ending April, 1916. Value.
Balata	26,790	$13,089	426,561	$169,760
Guayule gum			18,500	7,770
Gutta jelutong			2,773	305
Gutta percha			60,023	11,446
India rubber	393,085	268,748	4,011,942	2,312,311
Rubber scrap and refuse			9,204	734
Totals, unmanufactured	419,875	$281,837	4,529,003	$2,502,326
Chicle	405	$90	111,638	$32,801
MANUFACTURED—				
Gutta percha				$537
India rubber		$9		37,122
Totals, manufactured		$9		$37,659

EXPORTS OF RUBBER GOODS TO NON-CONTIGUOUS TERRITORIES OF THE UNITED STATES.

	April, 1916. Pounds.	April, 1916. Value.	Ten Months Ending April, 1916. Pounds.	Ten Months Ending April, 1916. Value.
To Alaska:				
Belting, hose and packing		$21,279		$107,402
Boots and shoes ..... *pairs*	10,649	27,702	57,737	146,430
Other rubber goods		6,168		29,627
Totals		$55,149		$283,459
To Hawaii:				
Belting, hose and packing		$14,274		$77,813
Automobile tires		37,497		441,276
Other tires		8,224		63,391
Other rubber goods		6,757		$72,589
Totals		$66,752		$655,069
To Philippine Islands:				
Belting, hose and packing		$6,182		$51,107
Boots and shoes ..... *pairs*			16,717	14,696
Tires		70,911		362,035
Other rubber goods		15,803		144,818
Totals		$92,896		$572,656
To Porto Rico:				
Belting, hose and packing		$4,009		$34,374
Automobile tires		38,126		312,304
Other tires		1,080		29,440
Other rubber goods		6,558		57,625
Totals		$49,773		$433,743

*Not separately stated prior to January 1, 1916.

RUBBER STATISTICS FOR CANADA.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

UNMANUFACTURED—*free:*	April, 1915. Pounds.	April, 1915. Value.	April, 1916. Pounds.	April, 1916. Value.
Rubber and gutta percha, crude caoutchouc or india rubber:				
From Great Britain	214,027	$116,267	641,732	$482,947
United States	217,603	101,882	425,706	281,357
Straits Settlements			33,849	21,607
Other countries	2,240	1,333		
Totals	433,870	$219,482	1,101,287	$785,911
Rubber, re-covered:				
From United States	360,982	$43,011	333,956	$53,860
Hard rubber, in sheets and rods:				
From United States	1,262	$162	411	$323
Rubber substitute:				
From Great Britain	4,938	$501		
United States	30,136	2,260	70,847	$6,054
Totals	35,074	$2,761	70,847	$6,054
Rubber, powdered, and rubber or gutta percha waste:				
From United States	18,119	$2,647	203,352	$8,693
Other countries			2,853	114
Totals	18,119	$2,647	206,205	$8,807
Rubber thread, not covered:				
From United States	1,803	$2,499	4,318	$6,544
Balata, crude:				
From United States	230	$131		
Chicle, crude:				
From United States	54,531	$21,998	18,056	$7,403
British Honduras	46,283	17,401	217,120	80,506
Mexico	79,387	27,953		
Totals	180,201	$68,352	235,176	$87,909

MANUFACTURED—*dutiable:*	April, 1915. General Tariff. Value.	April, 1915. Preferential Tariff. Value.	April, 1916. General Tariff. Value.	April, 1916. Preferential Tariff. Value.
Waterproof clothing:				
From Great Britain	$146	$47,492		$22,904
United States	7,209		$20,524	
Totals	$7,355	$47,492	$20,524	$22,904
Hose, lined with rubber:				
From Great Britain		$43		
United States	$5,735		$6,872	
Totals	$5,735	$43	$6,872	
Mats and matting:				
From United States	$298		$753	
Packing:				
From Great Britain		$321		
United States	$4,930		$5,464	
Totals	$4,930	$321	$5,464	
Tires of rubber for all vehicles:				
From Great Britain	$97	$3,726	$1,831	$1,437
United States	81,757		50,232	
France	2,863			
Other countries	246			
Totals	$84,963	$3,726	$52,063	$1,437
*Rubber cement, and all other manufactures of india rubber and gutta percha, N. O. P.:				
From Great Britain	$275	$22,286	$319	$22,704
United States	62,921		65,377	
Other countries	39		102	
Totals	$63,235	$22,286	$65,798	$22,704

Hard rubber, in tubes:				
From United States	$1,038	.....	$75	.....
Boots and shoes:				
From Great Britain	.....	$169	.....	$420
United States	$4,792	.....	$5,011	.....
Totals	$4,792	$169	$5,011	$420
Belting:				
From Great Britain	.....	$968	.....	$202
United States	$2,120	.....	$855	.....
Totals	$2,120	$968	$855	$202
Webbing—over one inch wide:				
From Great Britain	.....	$574	.....	$121
United States	$8,520	.....	$13,161	.....
Other countries	2	.....	.....	.....
Totals	$8,522	$574	$13,161	$121

*In addition the imports of rubber cement and all manufactures of india rubber and gutta percha not otherwise provided for amounted to $534 from various countries for April, 1916, and $78 for April, 1915.

EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS.

MANUFACTURED—*dutiable*:	April, 1915. Product of Canada. Value.	April, 1915. Re-exports of foreign goods. Value.	April, 1916. Product of Canada. Value.	April, 1916. Re-exports of foreign goods. Value.
Belting:				
To United States	.....	$35	.....	.....
Newfoundland	.....	.....	$439	.....
Totals	.....	$35	$439	.....
Hose:				
To Great Britain	.....	.....	$18,059	.....
United States	$3,004	.....	.....	.....
Newfoundland	.....	.....	188	.....
Other countries	.....	.....	101	.....
Totals	$3,004	.....	$18,348	.....
Boots and shoes:				
To Great Britain	$228	.....	$13,523	.....
United States	15	$28	6	.....
Newfoundland	.....	.....	279	.....
Australia	15	.....	.....	.....
Other countries	1,339	.....	1,337	.....
Totals	$1,597	$28	$15,145	.....
Tires:				
To Great Britain	.....	.....	$77,759	.....
United States	.....	.....	21,876	.....
Newfoundland	.....	.....	1,200	.....
Other countries	.....	.....	1,739	.....
Totals	.....	.....	$102,574	.....
*Rubber waste:				
To Great Britain	.....	.....	$7,313	.....
United States	.....	$1,347	15,431	.....
Totals	.....	$1,347	$22,744	.....
All other mnfs., N. O. P.:				
To Great Britain	$30,391	.....	$2,023	.....
United States	3,033	$94,961	198	.....
Newfoundland	237	.....	354	.....
Australia	1,952	.....	.....	.....
Other countries	697	.....	276	.....
Totals	$36,310	$94,961	$2,851	.....
†Gum chicle:				
To United States	$13,373	$15,000	$114,860	.....
Other countries	2,078	.....	.....	.....
Totals	$15,451	$15,000	$114,860	.....

*During April, 1916, 194,100 pounds of rubber waste were exported to the United States and 60,900 pounds to Great Britain. During April, 1915, 23,500 pounds were exported to the United States.

†During April, 1916, 114,860 pounds of gum chicle were exported to the United States. During April, 1915, 23,066 pounds were exported to the United States and 3,151 pounds to various countries.

LONDON AND LIVERPOOL RUBBER STATISTICS.

IMPORTS.

JUNE, 1916.

UNMANUFACTURED— Crude rubber:	London. Pounds.	London. Value.	Liverpool. Pounds.	Liverpool. Value.
From German West Africa	.....	.....	3,500	$1,283
Java	851,400	$596,750	.....	.....
Dutch Borneo	1,500	1,021	.....	.....
Other Dutch Possessions in Indian Seas	703,700	494,315	.....	.....
France	.....	.....	1,000	656
French West Africa	.....	.....	141,300	87,878
Portugal	54,000	26,730	2,200	583

UNMANUFACTURED—	May, 1916. Pounds.	May, 1916. Value.	Five Months Ending May, 1916. Pounds.	Five Months Ending May, 1916. Value.
Italy	7,500	5,468	.....	.....
Liberia	.....	.....	3,600	2,061
United States	.....	.....	2,000	1,030
Mexico	9,000	6,174	.....	.....
Colombia	9,100	4,423	.....	.....
Peru	.....	.....	55,800	36,139
Brazil	.....	.....	1,549,500	879,222
Bolivia	.....	.....	4,800	2,683
Gambia	.....	.....	300	136
Gold Coast	.....	.....	217,200	79,524
Nigeria	.....	.....	59,600	15,955
Cape of Good Hope	9,700	7,071	.....	.....
Zanzibar and Pembar	9,800	4,515	.....	.....
E. Africa Protectorate	1,600	972	2,200	1,458
Anglo-Egyptian Sudan	10,600	7,727	.....	.....
Aden & Dependencies	.....	.....	700	379
British India	192,800	127,662	.....	.....
Straits Settlements	1,854,200	1,215,223	327,900	219,516
Fed. Malay States	3,436,500	2,354,762	6,700	4,024
Ceylon and Dependencies	1,267,200	825,738	46,100	28,557
British North Borneo	157,500	107,328	.....	.....
British West Indies	400	292	.....	.....
British Honduras	.....	.....	1,500	826
British Guiana	500	243	.....	.....
Totals	8,577,000	$5,786,364	2,425,900	$1,361,910
Waste and reclaimed rubber:				
UNMANUFACTURED—				
From Canary Island	2,700	$136	.....	.....
China	23,500	1,837	.....	.....
United States	37,900	5,929	83,800	$10,852
Chile	.....	.....	.....	374
Malta	200	78	.....	.....
Gold Coast	.....	.....	4,000	243
Egypt	4,700	573	.....	.....
Cape of Good Hope	47,800	2,556	.....	.....
Natal	3,700	705	.....	.....
British India	15,700	1,458	10,000	1,152
Ceylon and Dependencies	6,400	306	.....	.....
British West Indies	300	48	.....	.....
Totals	142,900	$13,626	100,500	$12,621

RE-EXPORTS.

Crude rubber:	Pounds.	Value.	Pounds.	Value.
To Russia	6,700	4,860	126,100	87,480
Sweden	164,000	79,733	4,500	2,430
Norway	17,700	12,315	51,500	37,923
Denmark	22,100	13,268	.....	.....
France	1,033,600	751,259	894,200	628,339
Switzerland	11,200	6,804	.....	.....
Spain	19,900	15,610	20,300	14,240
Japan	205,800	146,560	168,700	107,805
Italy	.....	.....	51,100	41,694
Argentine	6,400	5,506	171,800	125,286
Canada	127,700	84,953	11,400	8,131
United States	6,525,200	4,619,275	333,100	118,365
Totals	8,140,300	$5,742,143	1,832,700	$1,171,693
Waste and reclaimed rubber:				
To France	.....	.....	24,900	4,262
Spain	.....	.....	2,200	243
Totals	.....	.....	27,100	4,505

EXPORTS.

Waste and reclaimed rubber: Mnfs. of the United Kingdom:	Pounds.	Value.	Pounds.	Value.
To Russia	.....	.....	6,900	566
France	23,000	4,802	76,800	14,429
Java	.....	.....	7,800	1,604
Spain	55,700	3,786	13,900	1,628
Italy	388,500	21,559	6,600	646
United States	504,300	27,566	122,100	15,839
Straits Settlement	3,300	612	.....	.....
Totals	974,800	$58,325	234,100	$34,812

RUBBER STATISTICS FOR ITALY.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

UNMANUFACTURED—	Three Months Ending March, 1915. Pounds.	Three Months Ending March, 1915. Value.	Three Months Ending March, 1916. Pounds.	Three Months Ending March, 1916. Value.
India rubber and gutta percha —raw and reclaimed:				
From Straits Settlements	370,040	.....	424,160	.....
African Fr. Colony	.....	.....	6,380	.....
Belgian Congo	.....	.....	120,780	.....
Brazil	735,020	.....	2,114,420	.....
Other countries	61,600	.....	456,940	.....
Totals	1,166,660	$716,435	3,122,680	$1,917,609
No. 2			.08	@ .08¼

MANUFACTURED—	Three Months Ending March, 1915. Pounds.	Value.	Three Months Ending March, 1916. Pounds.	Value.
India rubber and gutta percha —threads:				
From United States	10,780	.....	9,900	.....
Great Britain	9,680	.....	10,780	.....
Other countries	.....	.....	440	.....
Totals	20,460	$32,308	21,120	$33,350
India rubber and gutta percha —sheets:				
Cut sheets	1,100	$1,457	440	$583
Elastic fabric	1,540	473	220	67
Hard rubber	1,100	675	18,700	11,483
India rubber and gutta percha —tubes:				
Cut sheets	440	$656	440	$656
Elastic fabric:				
From Austria-Hungary	220	.....	.....	.....
Germany	2,640	.....	.....	.....
Other countries	15,840	.....	1,540	.....
Totals	18,700	$8,038	1,540	$662
Other forms	1,540	$743	1,100	$531
Belting	12,100	$6,369	32,120	$16,907
Rubber coated fabrics...*pieces*	14,520	$15,286	34,760	$36,593
Other forms:				
From Great Britain	3,740	.....	10,120	.....
Other countries	220	.....	.....	.....
Totals	3,960	$2,605	10,120	$6,658
Rubber boots and shoes:—*pairs*				
From United States	6,373	.....	9,673	.....
Austria-Hungary	1,531	.....	.....	.....
France	20	.....	10,023	.....
Germany	2,590	.....	.....	.....
Other countries	.....	.....	45	.....
Totals	10,514	$8,117	19,741	$15,240
Elastic webbing:				
From Austria-Hungary	3,080	.....	.....	.....
France	3,080	.....	3,520	.....
Germany	16,940	.....	880	.....
Other countries	5,060	.....	4,180	.....
Totals	28,160	$39,526	8,580	$12,043
Elastic fabric—not specified:				
From Austria-Hungary	5,500	.....	.....	.....
France	2,200	.....	134,200	.....
Germany	12,540	.....	.....	.....
Great Britain	21,780	.....	31,020	.....
Other countries	1,320	.....	1,320	.....
Totals	43,340	$25,441	166,540	$102,136
Tires:				
From France	20,240	.....	157,740	.....
Germany	1,980	.....	.....	.....
Great Britain	33,000	.....	73,480	.....
Other countries	660	.....	18,480	.....
Totals	55,880	$68,140	249,700	$304,486
Other rubber manufactures:				
From Austria-Hungary	5,720	.....	.....	.....
France	2,640	.....	489,720	.....
Germany	35,860	.....	.....	.....
Great Britain	49,280	.....	188,980	.....
Other countries	10,340	.....	183,700	.....
Totals	103,840	$45,548	862,400	$378,280
Total Imports	.....	$973,435	.....	$2,913,494

EXPORTS OF CRUDE AND MANUFACTURED RUBBER.

UNMANUFACTURED—	Three Months Ending March, 1915. Pounds.	Value.	Three Months Ending March, 1916. Pounds.	Value.
India rubber and gutta percha —raw and reclaimed	120,440	$27,167	308,880	$69,098
MANUFACTURED—				
India rubber and gutta percha —threads:				
To France	.....	.....	2,420	.....
Germany	5,720	.....	.....	.....
Great Britain	.....	.....	1,760	.....
Argentina	660	.....	2,200	.....
Other countries	8,580	.....	2,640	.....
Totals	14,960	$23,623	9,020	$14,343
India rubber and gutta percha —sheets:				
Cut sheets	3,080	$4,080	2,200	$2,914
Elastic fabric	880	270	.....	.....
Insulated wire	1,100	260	.....	.....
Hard rubber	15,620	9,592	25,300	15,536
India rubber and gutta percha —tubes:				
Cut sheets	.....	.....	7,040	$10,499
Elastic fabric	31,020	$13,334	18,480	7,944
Other forms	15,840	7,643	28,600	13,799
Belting	440	232	880	464
Elastic webbing:				
To France	440	.....	1,540	.....
Greece	14,300	.....	14,960	.....
Egypt	220	.....	5,280	.....
Argentina	9,460	.....	25,740	.....
Brazil	22,220	.....	18,260	.....
Cuba	12,100	.....	5,060	.....
Other countries	12,980	.....	25,740	.....
Totals	71,720	$100,669	96,580	$135,563
Elastic fabric—not specified:				
To Spain	660	.....	440	.....
Argentina	1,540	.....	5,940	.....
Brazil	.....	.....	220	.....
Uruguay	1,100	.....	.....	.....
Other countries	1,760	.....	4,400	.....
Totals	5,060	$7,990	11,000	$17,370
Tires:				
To France	.....	.....	59,620	.....
Great Britain	.....	.....	1,825,560	.....
Switzerland	178,200	.....	66,000	.....
India and Ceylon	7,920	.....	80,520	.....
Australia	660	.....	31,680	.....
Argentina	165,220	.....	236,280	.....
Brazil	78,540	.....	120,780	.....
Other countries	1,262,140	.....	80,080	.....
Totals	1,692,680	$2,064,069	2,500,520	$3,049,157
Other rubber manufactures:				
To Great Britain	.....	.....	16,720	.....
Switzerland	44,660	.....	4,180	.....
Argentina	20,460	.....	20,460	.....
Other countries	107,140	.....	58,740	.....
Totals	172,260	$107,294	100,100	$62,349
Total Exports	2,145,100	$2,365,963	3,108,600	$3,399,036

THE RUBBER SCRAP MARKET.

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NEW YORK.

THERE was very little prospect early in July of much activity in the rubber scrap market during the month. And so it was proven, as week after week passed without important changes in market conditions or price levels. It is true that values were slightly lower at the close of the month, which is only a natural result of weakness, due to a dull market.

The mills are undoubtedly well supplied with stocks that will carry them over the quiet period between now and the time for speeding up for fall business. As crude rubber responds to the dictation of London, in a similar way rubber scrap is influenced by the conditions controlling the crude rubber market, which has been quiet.

Boots and shoes, early in the month, developed an easier tendency and some dealers were making offers of 8½ cents delivered. It was reported that buyers were secured at these figures. Tires were quiet, with the exception of a little movement in mixed auto tires at 6⅛ cents. White goods were nominally quoted to mills at 8¼ to 8⅜ cents, and bicycle tires were steady at 4⅛ to 4¼ cents. There was no change in No. 1, inner tubes, being nominally held at 26 to 27 cents delivered. The balance of the list was devoid of new features and prices were nominally unchanged.

The month closed without improvement in the generally dull condition that has characterized the rubber scrap market for the past month. There is belief in some quarters that a general buying movement is due early in August. By referring to the following market quotations of July 28, it will be seen that there has been a slight downward revision of prices since a month ago, and practically no change during the last three weeks of July.

NEW YORK QUOTATIONS FOR CARLOAD LOT DELIVERED.

JULY 28, 1916.

Prices subject to change without notice.

	Per Pound.
Boots and shoes	$0.08½ @
Trimmed arctics	.06¾ @ .06⅞
White tires, Goodrich and Goodyear	.08¼ @ .08⅜
Auto tires, standard white	.06⅛ @ .06¼
standard mixed	.06⅛ @ .06¼
stripped, unguaranteed	.04¼ @ .04⅜
Auto peelings, No. 1	.09½ @ .09⅝
No. 2	.08 @ .08¼

Inner tubes, No. 1	.25	@	.25½
No. 2	.11	@	.11½
red	.10	@	
Irony tires	.02	@	.02⅛
Bicycle tires	.04⅛	@	.04¼
Solid tires	.05⅛	@	.05¼
White scrap, No. 1	.13¾	@	.14¼
No. 2	.10	@	.10½
Red scrap, No. 1	.10	@	.11
No. 2	.08	@	.09
Mixed black scrap, No. 1	.04	@	.04¼
No. 2	.03¾	@	.03⅞
Rubber car springs	.04	@	.04½
Horse shoe pads	.04½	@	.04⅝
Matting and packings	.00⅞	@	.01
Garden hose	.01⅜	@	.01½
Air brake hose	.05¼	@	.05¼
Cotton fire hose	.02½	@	.02⅝
Large hose	.01⅝	@	
Hard rubber scrap, No. 1, bright fracture	.24	@	.25
Battery jars (black compound)	.02½	@	.02⅝
Insulated wire stripping	.03	@	.03½
Rubber heels	.03½	@	.03⅝

Exports of waste and reclaimed rubber from London and Liverpool for June, 1916, were 600 tons, divided as follows: United States, 313 tons; Italy, 197 tons; France, 49 tons; Spain, 35 tons; Java and Straits Settlements, 6 tons.

MARKET FOR COTTON AND OTHER FABRICS.

NEW YORK.

IT was generally expected that the official figures for June would indicate a falling off in the condition of the present cotton crop. The actual report, however, revealed a condition of 81.1 compared with 80.2, the ten-year average. Favorable crop progress during June is not, as a rule, accepted as conclusive evidence of future yield. More apprehension is felt of the uncertainty between now and the maturing period, particularly on account of the restriction in the use of fertilizer and the evidence that boll weevil are more numerous than ever before within a restricted area.

EGYPTIAN COTTON.

Cabled reports from Alexandria indicate a rather sensitive market, due, no doubt, to the approaching finish of the old crop stock. There is apparently a good demand from abroad, which is rapidly exhausting present stocks, resulting in a very narrow market that is extremely liable to fluctuate. Sakelarides qualities are practically exhausted. Crop growth is reported to be very satisfactory.

SEA ISLAND COTTON.

The weather during the month of June has been generally favorable, and the crop has made satisfactory progress. The entire section has had beneficial rains, which have improved the outlook very much. Although in some instances the young plant is reported small and backward, the general condition is quite up to a good average, and with continuance of favorable weather the new crop may begin to come to market the latter part of August and early September. Estimates still are about 100,000 bales and upwards.

TIRE FABRICS.

The July market for tire fabrics has generally maintained a strong position, although the situation during the last week of the month appeared to be somewhat easier. This was due to the usual quiet that prevails at this time of the year, when full deliveries are not strictly held to contract.

Producers have therefore been able to meet their obligations that would have been otherwise burdensome. Deliveries of new loom equipment are slow and overtime and double shift operations are seriously interfered with through a scarcity of textile workers.

Sea Island building fabric has advanced, but Egyptian and Peelers have recorded no change during the month.

COTTON DUCK.

The demand for duck has been accelerated by orders for government requirements and the market is firm with prices of hose and belting duck at the same levels as a month ago.

NEW YORK QUOTATIONS.

JULY 27, 1916.

Prices subject to change without notice.

Aeroplane and Balloon Fabrics:				
Wamsutta, S. A. I. L. No. 1, 40-inch *yard*	$0.26	@		
No. 4, 38½-inch	.26	@		
O/X B. 36-inch	.12¾	@		
Wool Stockinettes—52-inch:				
A—14-ounce *yard*	1.12½	@		
B—14-ounce	1.25	@		
C—14-ounce	1.50	@		
Cotton Stockinettes—52-inch:				
D—14-ounce *yard*	.49	@	.50	
E—11½-ounce	.39	@	.40	
F—14-ounce	.53	@	.54	
G— 8-ounce	.43	@	.44	
H—11-ounce	.48	@	.49	
I — 9-ounce	.40½	@	.41¾	
Colors—white, black, blue, brown.				
Tire Fabrics:				
17¼-ounce Sea Island, combed *square yard*	.83	@		
17¼-ounce Egyptian, combed	.70	@		
17¼-ounce Egyptian, carded	.63	@	.67	
17½-ounce Peelers, carded	.45	@	.50	
Sheeting:				
40-inch 2.35-yard *yard*	.10½	@		
40-inch 2.50-yard	.10	@		
40-inch 2.70-yard	.09½	@		
40-inch 2.85-yard	.08¾	@		
40-inch 3.15-yard	.08½	@		
Osnaburgs:				
40-inch 2.25-yard *yard*	.12	@		
40-inch 2.48-yard	.11	@		
37½-in. 2.42-yard	.11¼	@		
Mechanical Ducks:				
Hose *pound*	.28	@	.29	
Belting	.28	@	.29	
Carriage Cloth Duck:				
38-inch 2.00-yard enameling duck *yard*	.14	@		
38-inch 1.74-yard	.16	@		
72-inch 16.66-ounce	.33	@		
72-inch 17.21-ounce	.34	@		
Drills:				
38-inch 2.00-yard *yard*	.14	@		
40-inch 2.47-yard	.11	@		
52-inch 1.90-yard	.15	@		
52-inch 1.95-yard	.14¾	@		
60-inch 1.52-yard	.20	@		
Yarns:				
Garden Hose, 12/2 cabled *pound*	$0.28	@	.30	
Fire Hose 12/1	.27	@	.29	
Imported Woolen Fabrics Specially Prepared for Rubberizing—Plain and Fancies:				
63-inch, 3¼ to 7½ ounces *square yard*	.38	@	1.55	
36-inch, 2¾ to 5 ounces	.35	@	.85	
Imported Plaid Lining (Union and Cotton):				
63-inch, 2 to 4 ounces *square yard*	.35	@	.75	
36-inch, 2 to 4 ounces	.20	@	.45	
Domestic Worsted Fabrics:				
36-inch, 4½ to 8 ounces *square yard*	.25	@	.45	
Domestic Woven Plain Linings (Cotton):				
36-inch, 3¼ to 5 ounces *square yard*	.15½	@	.20	
Raincoat Cloth (Cotton):				
Bombazine *yard*	.06	@	.08	
Twills	.10	@	.15	
Tweed	.20	@	.35	
Tweed, printed	.06	@	.15	
Plaid	.08	@	.10	
Repp	.18½	@	.25	
Burlaps:				
32—7½-ounce *100 yards*	6.10	@		
40—7½-ounce	6.55	@		
40—8-ounce	6.65	@		
40—10-ounce	7.50	@		
40—10½-ounce	7.75	@		
45—7½-ounce	7.80	@		
45—8-ounce	7.90	@		
48—10-ounce	12.00	@		

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS.

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NEW YORK.

THE summer dullness usually experienced at this time of the year has had a depressing effect on the market for the past month. The mills are busy with stock taking, making repairs and additions to plant equipment in anticipation of a record fall business, and are paying little attention to present market con-

ditions. They are well supplied with materials bought at the high figures ruling early in the summer, and the indications are that lower prices now ruling will not prove attractive until buyers are forced to come into the market for fall requirements. This situation makes the market easy, with a tendency to further lower values of certain materials that have already declined during the month.

The decline in values of the basic metals during the month is the fundamental cause of lower prices in the chemical market. Colors of domestic source are firm, though some recessions in price are noted. Imported grades are still high and scarce, with no prospect of a change for the better.

ANTIMONY SULPHURETS. The domestic production of both crimson and golden antimony of the best grades is meeting with a good demand; however, prices have declined about 5 cents a pound and are now almost normal.

BENZOL. The recent increase in output has resulted in a decline of 5 cents a gallon from prices ruling a month ago.

BARYTES. Consumption is about normal on both grades, and stocks in first hands are moderate, which accounts for the firm prices quoted.

LITHARGE. There has been a steady undertone to the market during this month, due to a good demand with only moderate stocks in sight.

LITHOPONE. Producers have been well sold ahead and consumers appear to be well covered. Liberal offers in second hands evidently have weakened the market, which has declined.

WHITING. The unchanged chalk situation and high freights with no immediate relief in sight have strengthened the position of whiting. Prices are firm and spot stocks are scarce.

ZINC OXIDE. With prices fixed on both American and French process zinc oxide for the next six and three months, respectively, there is nothing new to record.

NEW YORK QUOTATIONS.

JUNE 29, 1916.

Subject to change without notice.

Acetone (drums)	lb.	$0.40	@	
Acid, acetic, 28 per cent. (bbls.)	lb.	.06	@	.06¼
cresylic (crude)	gal.	.75	@	.80
glacial, 99 per cent (carboys)	lb.	.45	@	.50
muriatic, 20 degrees	lb.	.02½	@	
nitric, 36 degrees	lb.	.06¼	@	
sulphuric, 60 degrees	lb.	.01	@	
Alumina Pigment, No. 1 (sacks)	ton	16.00	@	
Aluminum Flake (carloads)	ton	22.00	@	
Ammonium carbonate	lb.	.09½	@	.10
Antimony, crimson, sulphuret of (casks)	lb.	.70	@	.80
crimson, "Mephisto" (casks)	lb.	.75	@	
golden, sulphuret of (casks)	lb.	.40	@	
golden, "Mephisto"	lb.	.35	@	
golden, sulphuret, States brand, 16-17 per cent.	lb.	.45	@	
Asbestine	ton	21.00	@	
Asbestos	ton	15.00	@	35.00
Asphaltum "G" Brilliant	lb.	.03	@	
Barium sulphate, precipitated	ton	120.00	@	160.00
Barytes, pure white	ton	30.00	@	35.00
off color	ton	18.00	@	25.00
Basofor	ton	160.00	@	
Benzol, pure	gal.	.70	@	.75
Beta-Naphthol	lb.	1.25	@	1.50
Black Hypo	lb.	.75	@	
Bone ash	lb.	None		
black	lb.	.04	@	.08
Cadmium tri-sulphate (f. o. b. London)	lb.	2.75	@	
yellow		None		
Cantella gum	lb.	.27½	@	.35
Carbon, bisulphide (drums)	lb.	.06	@	
black (cases)	lb.	.14	@	.20
tetrachloride (drums)	lb.	.18	@	.20
Caustic soda, 76 per cent.	lb.	.04	@	.04½
Chalk, precipitated, extra light	lb.	.04½	@	.05¼
precipitated, heavy	lb.	.04	@	.05
China clay, domestic	ton	10.00	@	15.00
imported	ton	40.00	@	50.00
Chrome, green	lb.	.50	@	
yellow	lb.	.30	@	.45
Coal tar	bbl.	4.50	@	
Corn oil, refined	cwt.	9.16	@	
Cotton linters	lb.	.08	@	.08½
Gas black	lb.	.14	@	.20
Gilsonite	ton	37.50	@	
Glycerine, C. P. (drums)	lb.	.45	@	
Graphite, flake (400 pound bbl.)	lb.	.12	@	
powdered (400 pound bbl.)	lb.	.06	@	
Green oxide of chromium (casks)	lb.	.75	@	
Ground glass (fine)	bbl.	.02¾	@	
Indian red, reduced grades	lb.	.03¾	@	.05½
pure	lb.	.05½	@	.07½
Infusorial earth, powdered	ton	60.00	@	
bolted	ton	65.00	@	
Iron oxide, red, reduced grades	lb.	.02½	@	.03½
red, pure, bright	lb.	.08	@	.08¾
Ivory, black	lb.	.16	@	.30
Lampblack	lb.	.12	@	.18
Lead, red oxide of	lb.	.09¾	@	.10
sublimed blue	lb.	.08¾	@	.09
sublimed white		.08¾	@	.09
white, basic carbonate	lb.	.08¾	@	.09
white, basic sulphate	lb.	.08¾	@	
Lime, flour	lb.	.01¼	@	.01½
Litharge	lb.	.09	@	.10
English	lb.	.10	@	.11
Lithopone, domestic	lb.	.10	@	.11
Imported	lb.	.12	@	.14
Magnesia, carbonate	lb.	.12	@	.15
calcined, heavy	lb.	.60	@	.70
heavy, Thistle Brand	lb.	.14	@	
light	lb.	.60	@	.70
Magnesite, calcined, powdered	ton	35.00	@	39.00
Mica, powdered	lb.	.03½	@	.05
Mineral rubber	lb.	.01¼	@	.03½
"M. R. X."	ton	100.00	@	
"Genasco"	ton	36.50	@	
"L. M. R."	ton	50.00	@	
"Richmond Brand"	lb.	.03	@	
"No. 64 Brand"	ton	35.00	@	
Naphtha, stove gasolene (steel bbls.)	gal.	.24	@	
66@68 degrees "	gal.	.28	@	
68@70 degrees "	gal.	.29	@	
V. M. & P. "	gal.	.23	@	
Oil, aniline	lb.	.45	@	.55
linseed (bbl.)	gal.	.68	@	
palm	gal.	.13½	@	.14
paraffin	gal.	.17	@	
pine (cases)	gal.	.70	@	
rapeseed	gal.	1.00	@	1.05
rosin, heavy body	gal.	.38	@	
tar (cases)	gal.	.21	@	
soluble aniline colors, yellow, orange, red, violet, blue, green	lb.	.10	@	.75
Orange mineral, domestic	lb.	.12	@	.12½
Paragol (carloads)	cwt.	8.99	@	
Petrolatum	lb.	.05¼	@	
Petroleum grease	lb.	.04¼	@	
Pine solvent		None		
Pine tar	bbl.	7.50	@	
Pitch, burgundy	lb.	.03¾	@	.04
pine	bbl.	3.50	@	4.00
Plaster of paris	lb.	1.50	@	1.70
Prussian blue	lb.	1.50	@	
Pumice stone, powdered (bbls.)	lb.	.03	@	.04
Resin, Pontianak, refined	lb.	.18	@	
granulated	lb.	.15	@	
fused	lb.	.14	@	
Rosin (280 pound bbls.)	bbl.	8.00	@	
Rotten stone, powdered	lb.	.02½	@	.04
Rubber black	lb.	.04½	@	
Rubber substitute, black	lb.	.07½	@	.09½
white	lb.	.11½	@	.17½
brown	lb.	.13	@	.17½
Rubhide		Nominal		
Shellac, fine orange	lb.	.30	@	.33
Soapstone, powdered	ton	7.50	@	20.00
Starch, corn, powdered	lb.	.02¼	@	.02½
Sulphur chloride (drums)	lb.	.06½	@	.09¼
Sulphur, flour, velvet, Brooklyn brand (carloads)	cwt.	2.20	@	
Talc, American	ton	12.50	@	17.50
French	ton	17.50	@	24.00
Toluol, pure	gal.	4.50	@	4.75
Tripolite earth, powdered	lb.	.03	@	.03½
bolted		None		
Turpentine, pure gum spirits	gal.	.48½	@	
wood	gal.	.40	@	
Venice	gal.	.11	@	.12
Ultramarine blue	lb.	.10	@	.50
Vermilion, brilliant	lb.	1.00	@	1.25
Chinese	lb.	.95	@	1.00
English	lb.	1.50	@	1.60
Wax, beeswax, white	lb.	.48	@	.60
ceresin, white	lb.	.08	@	.20
carnauba	lb.	.26	@	.42
ozokerite, black	lb.	.65	@	.85
green	lb.	.80	@	.90
montan	lb.	.30	@	.32
paraffin, refined, 118/120 m. p. (cases)	lb.	.06½	@	
123/125 m. p. (cases)	lb.	.07	@	
128/130 m. p. (cases)	lb.	.08	@	
133/136 m. p. (cases)	lb.	.09½	@	.12
crude, white, 117/119 m. p. (bbls.)	lb.	.05	@	
yellow, 124/126 m. p. (bbls.)	lb.	.05½	@	
Whiting, Alba	cwt.	.55	@	.65
commercial	cwt.	.75	@	1.00
gilders	cwt.	.85	@	1.00
Paris, white, American	cwt.	.90	@	1.00
English cliffstone	cwt.	1.50	@	
Wood pulp XXX (carloads)	ton	22.00	@	
Yellow ochre (Satin)	lb.	.02	@	
Zinc oxide, American process, horsehead brand				
"special"	f. o. b. factory lb.	.10½	@	
"XX red"	f. o. b. factory lb.	10	@	
French process, green seal,	f. o. b. factory lb.	.16½	@	
red seal,	f. o. b. factory lb.	.16½	@	
white seal,	f. o. b. factory lb.	.17½	@	.26
Zinc sulphide, pure	lb.	None		

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THE SLIPKNOT RUBBER HEEL.

A new rubber heel has recently come on the market. This is the "Slipknot," and the appropriateness of the name will be seen from the accompanying illustration in which it will be noticed that a slipknot forms a part of the design. Not all commodity names involving a pun are to be commended, but this one is a happy selection, as it describes the character of the heel and enables the name to be easily remembered. Another point brought out by the accompanying cut is the raised crescent-shaped section around the back of the heel, which adds to its durability and its non-slipping qualities. [Plymouth Rubber Co., Canton, Massachusetts.]